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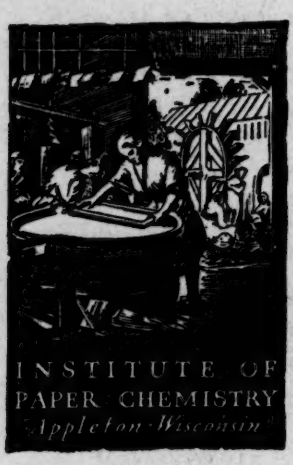
BULLETIN

OF

THE INSTITUTE OF PAPER CHEMISTRY



AFFILIATED WITH
LAWRENCE COLLEGE
APPLETON, WISCONSIN

LIBRARY NOTES

JANUARY • 1952
Volume 22 Number 5

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Books and Pamphlets Added to the Library During December

BACTERIOLOGY

WERKMAN, C. H., and WILSON, P. W., ed. Bacterial physiology. New York, Academic Press, 1951. 707 p.

CARBOHYDRATES

ADVANCES in carbohydrate chemistry. Ed. by Claude S. Hudson [and] Sidney M. Cantor. Associate editors for the British Isles, Stanley Peat [and] Maurice Stacey. New York, Academic Press, 1951. v. 6. 442 p.

FLAVOR

DAWSON, ELSIE H., HARRIS, BETSY L., *and others.* Sensory methods for measuring differences in food quality; review of literature and proceedings of conference. Bureau of Human Nutrition and Home Economics. Agriculture information bulletin no. 34. Washington, U. S. Govt. Print. Off., 1951. 134 p.

NEWSPRINT

U. S. CONGRESS. HOUSE. *Committee on Interstate and Foreign Commerce. Special Subcommittee on Investigation of Newsprint and Other Matters.* Newsprint investigation. Canadian supplies. Progress report . . . pursuant to H. Res. 116 (82d Congress, 1st Session), submitted by Mr. [Lindley] Beckworth, chairman. House report no. 1093. Washington, U. S. Govt. Print. Off., 1951. 10 p.

PULP—TESTING

SIEBER, RUDOLF. Die chemisch-technischen Untersuchungs-Methoden der Zellstoff- und Papier-Industrie. 2. neubearb. u. erw. Aufl. Berlin, etc., Springer-Verlag, 1951. 900 p.

SULFITE PROCESS

KAUFMANN, ZENO. Über die chemischen Vorgänge beim Aufschluss von Holz nach dem Sulfitprozess. Untersuchungen aus dem Laboratorium der Cellulosefabrik Attisholz AG. vorm. Dr. B. Sieber, Attisholz bei Solothurn (Schweiz). [Dissertation der Eidgenössischen Technischen Hochschule in Zürich. Zürich, Dissertationsdruckerei Leemann AG, 1951] 117 p.

SURFACE TENSION

GREGG, S. J. The surface chemistry of solids. New York, Reinhold, 1951. 297 p.

TRADE DIRECTORIES

NATIONAL DIRECTORY of the Canadian pulp and paper industries, 1951. J. N. Stephenson, editor. Gardenvale, Que., National Business Publications Limited, 1951. 474 p.

TRADE NAMES

HAYNES, WILLIAMS. Chemical trade names and commercial synonyms; a dictionary of American usage. New York, Van Nostrand [c1951] 279 p.

WOOD

ISENBERG, IRVING H. Pulpwoods of the United States and Canada. 2d ed. Appleton, Wis., The Institute of Paper Chemistry, 1951. 187 p.

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

ABSORPTION SPECTRA

FREUDENBERG, KARL, DIETRICH, HEINZ, and SIEBERT, WOLFGANG. Infrared absorption spectra of lignin-related compounds. Chem. Ber. 84, no. 10: 961-71 (Nov. 30, 1951). [In German] *cf.* B.I.P.C. 21: 243.

The infrared absorption spectra of *p*-coumarylaldehyde, *p*-coumaryl alcohol (I), the dehydrogenation polymer (DHP) of (I), coniferyl aldehyde, coniferyl alcohol (II), DHP-II, DHP-II and sinapinyl alcohol (1:1), pinoresinol (III), DHP-III, sinapinyl aldehyde, sinapinyl alcohol (IV), DHP-IV, and dehydrodisinapinyl alcohol were determined, and the individual bands of the various spectra are discussed in detail. 1 table, 7 figures, and 6 footnotes. F.E.B.

ADHESIVES

GALLAGHER, W. C., and WRIGHTSMAN, J. H. Viscosity stabilization of starch corrugating adhesive. Fibre Containers 36, no. 12: 126-9 (December, 1951).

An improved carrier starch for use as the gelatinized portion of the starch corrugating adhesive has been developed for stabilizing the viscosity of the corrugating paste to an extent which has been hitherto unobtainable and which eliminates the need for "spiking" (addition of an extra amount of pearl starch for making up the losses in initial viscosity on continued use). An amount of modified carrier comprising 20% or less of the total dry starch in the finished paste is used. Since it would be impracticable to make a starch paste which requires no viscosity adjustments because of different machine, liner, and medium requirements, the amounts of stabilized starch added are adjusted to individual requirements. Once a standard amount of carrier starch has been established, there is little necessity for changing the proportions, unless changes in the quality of board should make a new formula necessary. The modified carrier starch has been in successful commercial use for two years; data on its superiority over ordinary pearl starch carrier are included. 2 tables and 1 diagram. E.S.

ADHESIVES—TESTING

ERIKSON, CARL. Pretesting procedures for envelope adhesives. Am. Paper Converter 25, no. 12: 10-11, 50, 52, 54-6 (December, 1951).

A series of tests is presented for pretesting envelope gums. It is emphasized that the testing procedures are on a laboratory basis and cannot definitely predict the results of machine trials. In general, the characteristics and properties of the envelope adhesive will vary with the type of machine to be used for its application. Tests for drying time, curl, blocking, taste, adhesion, and gloss are given for front-seal gum, and humidity resistance, wrinkle, adhesion, and stain tests are given for back-seam gum. 5 tables and 3 figures. M.W.

ADVERTISING

NESBITT, ALEXANDER. How to design blotters. Am. Printer 132, no. 11: 40-1, 71-2 (November, 1951).

The advertising value of blotters is discussed. In a preliminary historical review it is pointed out that although the first reference in English to blotting paper appeared in 1465, no definite date can be established for its emergence to popular usage; nothing is known about the first printed advertising blotter. 6 illustrations. M.W.

ALKALINE PROCESSES—ODOR TROUBLE

BRITISH COLUMBIA RESEARCH COUNCIL. B C Research Council reduces kraft mill odor. Can. Pulp Paper Ind. 4, no. 12: 15-16 (December, 1951); Paper Trade J. 134, no. 2: 14, 42 (Jan. 11, 1952).

Reference is made to the malodorous substances released in kraft mill operation from various points, the first important step toward an effective solution presented by the Bergström black-liquor oxidation tower, and to the new unit developed by the Research Council in co-operation with several companies. A packing for the new oxidation apparatus has been developed which is claimed to eliminate foaming of the black liquor, and mill trials have shown that the malodorous constituents are absorbed very effectively. No further details are disclosed; the design of a full-scale unit is now available. E.S.

ANTIOXIDANTS

KURTH, E. F., and CHAN, FRANK L. Dihydroquercetin as an antioxidant. J. Soc. Am. Oil Chemists' Assoc. 28, no. 10: 433-6 (October, 1951).

Dihydroquercetin, a white crystalline pentahydroxyflavanone (which occurs in large quantities in Douglas-fir and Jeffrey pine barks) was found to be an effective antioxidant for lard, cottonseed oil, and butter oil. This compound imparts no taste and color to fats and oils and, like quercetin, appears to be nontoxic. It was found that 0.03% quercetin was slightly more effective than 0.03% dihydroquercetin as an inhibitor of rancidity in lard. The presence of a small amount of citric acid increased markedly the antioxidant effect of dihydroquercetin on lard. The pentaacetate, pentapropionate, and the pentabenzoate esters of dihydroquercetin showed no antioxidant activity. 3 tables, 6 figures, and 14 references. E.S.

BARK

WIKLUND, H. Bark as a fuel. Paper and Timber (Finland) 33, no. 11: 353-4 (November, 1951). [In Swedish; English summary]

A sample calculation is given to show that any Finnish mill with available wet bark will find it profitable (as compared with Finnish fuel prices) to press the bark and dry it with flue gases in a drum and to utilize the resulting product with 30% moisture as a fuel. 1 diagram. E.S.

BEATING

JOHNSTON, H. W., and LODGE, W. C. Effect of refining on beating rate of dried kraft pulp. Tappi 34, no. 12: 566-72 (December, 1951).

This investigation was undertaken to determine the effect produced on the processing of dried kraft pulp by refining the raw pulp before drying it.

Samples of pulp in the raw state and refined to three different degrees, all undried, were subjected to laboratory beater and strength tests. Similar samples after being dried were similarly tested. The results indicated that: (1) refining the raw pulp before drying it reduces the time which would otherwise be needed to process it for use; (2) within limits, the strength of a refiner-treated pulp at a given beating time is roughly proportional to the energy consumed in the refiner or, at a given strength, the beating time is inversely proportional to that energy; (3) the maximum strength of pulp processed in the Valley beater is higher than that of the pulp partly processed in the refiner and partly in the beater; and (4) drying adversely affects the beating time and maximum development of all pulp; however, refiner-treated pulp is not affected any more than raw pulp, nor is there any difference between the two in the ease with which they are repulped. 12 tables, 1 figure, and 1 reference. E.S.

TOLVI, ERKKI K. Beating in mill beater and jordan refiner. Paper and Timber (Finland) 33, no. 2: 27-32; no. 5: 169-74 (February, May, 1951). [In Finnish; English summaries]

The first part of the article deals with the theory of the beating process, followed by a discussion of the results of beating sulfate pulp in an 8000-liter beater under 80-kw. maximum load at 2,3,4,5, and 6% consistency and at four different beating pressures. The efficiency of the mill beaters was calculated by applying Milne's equation and correlated to that shown by the beating tests. A certain relationship was found between the values calculated from the size of the beater bars and the strength properties obtained in the beating tests. 4 tables, 20 figures, and 16 references.

In the second part the influence of beating pressure, consistency, and throughput on the strength properties of kraft pulp treated in a jordan with a maximum load of 280 kw. at 250 r.p.m. and on power consumption was investigated. The most favorable results were obtained when the jordan was operated at full load, provided the pulp had been slightly prebeaten in a hollander to improve the tearing strength. With regard to power consumption, a 2.5-3% consistency was found to be the most suitable for this particular jordan. A higher consistency gave slightly higher strength values than a lower consistency. With a stepwise jordan treatment, the power consumption depended on throughput, total amount of pulp, and beating degree. A high throughput was more favorable than a low one at the beginning of the beating process. 4 tables, 22 figures, and 2 references. E.S.

TOLVI, ERKKI K. Beating in mill beater and jordan refiner. III. Refining in a Hydrafiner. Paper and Timber (Finland) 33, no. 11: 338-42 (November, 1951). [In Finnish; English summary]

An account of two series of beating experiments in a Hydrafiner size No. 1 (I) at the Finnish kraft mill in Walkiakoski is given. In the first series, a 150-kw., 1450-r.p.m. motor was used, and the gap between the bars of (I) was 0.5-1.3 mm.; consistencies of 3-5% were employed. The effects of consistency and throughput were investigated. At high consistencies, the tearing strength rapidly reached its maximum value and remained there throughout the entire beating period. Breaking length and burst improved throughout, although rather slowly. When low consistencies were employed, the results resembled those obtained in a jordan, although (I) gave a better performance. In the second series, the bars of (I) were brought closer together (gap 0.18-0.22 mm.) and a 980-r.p.m. motor was connected. At high consistencies, good strength properties of the sulfate pulp resulted from this vigorous treatment, and the power consumption was favorable. In the higher consistency ranges a centrifugal pump was connected to the feed end of (I)

to raise the head sufficiently. Variations in the throughput had no effect on strength properties. Hence, variations in the desired strength properties can be brought about by changing the pulp consistencies. 4 tables, 22 figures, and 10 references. E.S.

BIRCH

JENSEN, WALDEMAR. Birch as a raw material in pulp manufacture. III. The strength properties of mixtures of birch and pine sulfate pulps. Paper and Timber (Finland) 33, no. 11: 333-6 (November, 1951). [In Swedish; English summary] *cf.* B.I.P.C. 21: 532-3.

The strength properties of mixtures of birch and pine sulfate pulps were studied, and the results are presented in a table and a number of graphs. An addition of 10% of birch pulp to pine sulfate pulp causes a slight increase in the strength properties; the percentage of birch pulp may be increased to approximately 20% before a decrease in the quality of the mixture becomes noticeable. 1 table, 12 figures, and 3 references. E.S.

JENSEN, WALDEMAR. The technical and chemical aspects of birch; a condensation of the original paper. Svensk Papperstidn. 54, no. 21: 739-45 (Nov. 15, 1951). [In Swedish; English and German summaries]

The chemical and technical properties of birchwood are reviewed with reference to the two species *Betula verrucosa* and *B. pubescens*. The morphology and chemistry of the outer and inner barks and of the wood are considered separately. The suitability of birch as a pulpwood is discussed; a pulp suitable for many applications can be obtained. The sulfate process gives higher yields and stronger pulps than the sulfite process. However, the suitability for papermaking is limited by the shortness of the fibers. Hägglund has shown that a satisfactory rayon pulp can be produced from birchwood by the sulfite process. Semichemical procedures may open new possibilities for the utilization of birch as pulpwood. 4 tables, 16 figures, and 26 references. E.S.

BLACK LIQUOR—OXIDATION

DEHAAS, GERRITT G. Stabilization of Douglas fir kraft black liquor. Pulp & Paper 25, no. 13: 70, 72 (December, 1951); *cf.* B.I.P.C. 22: 94.

This is a somewhat condensed version of the previous article. E.S.

BOARD

THE PLASWOOD CORPORATION, *Detroit*. Wood from waste. Du Pont Mag. 45, no. 6: 24-5 (December, 1951-January, 1952); *cf.* B.I.P.C. 20: 471.

In the Plaswood process for the manufacture of structural board, waste wood is reduced to fingernail size by chipping and grinding, and dried. The treated material is coated with a urea-formaldehyde adhesive which imparts strength and makes the board resistant to water and attack by fungi or termites. The board may be handled like wood and is used as core stock for plywood and furniture where its dimensional stability is important. 4 illustrations. M.W.

BOARD—CONVERSION

BOXBOARD CONTAINERS. Carton cutting and creasing. I-V. Box-

board Containers 69, no. 703: 30-2; no. 704: 25-6; no. 705: 17-18, 69; no. 706: 29-30, 32; no. 707: 14, 17, 19 (July-November, 1951).

The first two articles of the series concern the procedure of make-ready and include suggestions for the selection of rule heights and reasons and corrections for low spots. In the third article, the operation of a cylinder cutting-creasing press is described. Stripping waste from blanks by hand and mechanical devices for stripping waste are discussed in the fourth and fifth articles. 18 illustrations. M.W.

BOARD MILLS—DIRECTORIES

FIBRE CONTAINERS. Official board mill directory. Fibre Containers 36, no. 12: 85, 100, 102-4, 106-25 (December, 1951); *cf.* B.I.P.C. 21: 384.

The annual directory of board mills in the United States and Canada is presented, including a regular listing, a specialty board mill section, and an alphabetical list of board mills. E.S.

BOARD MILLS—WASTE LIQUOR

KNACK, M. F. Treatment of board mill waste at River Raisin Paper Company, Monroe, Mich. Sewage Ind. Wastes 23, no. 12: 1533-6 (December, 1951); *cf.* B.I.P.C. 21: 307-8.

This is the same article as abstracted in the previous reference. 1 table. M.W.

BOARD SPECIALTIES

ARMSTRONG CORK COMPANY. Capping the roll. Modern Packaging 25, no. 4: 90-1 (December, 1951).

A special grade of Temlok, a fiberboard impregnated with asphalt for extra strength and water resistance, is being used for end protectors for materials which are shipped in rolls. The fiberboard protectors are light in weight, have enough inherent resiliency so that no corrugated disks or cushions are required, and will not warp. 7 illustrations. M.W.

BORAX

BORAX CONSOLIDATED, LIMITED. *Technical Service Department, London.* The use of borax in paper manufacture. World's Paper Trade Rev. 136, no. 18: 1286 (Nov. 1, 1951).

Applications of borax in the paper industry include the stabilization of casein coating solutions, the buffering of rosin sizes, and the inhibition of mold growth in organic materials, such as sizes, adhesives, and lacquers. Reference is made to a new concentrated form of borax sold under the trade name NEOBOR, which has all the properties of ordinary borax but smaller quantities are required. For all practical purposes, three sacks of NEOBOR are equivalent to four of ordinary borax. E.S.

CARBOHYDRATES

REEVES, RICHARD E. Cuprammonium-glycoside complexes. Advances in Carbohydrate Chem. 6: 107-34 (1951).

A review is presented of the complexing reaction between cuprammonium and carbohydrate molecules with special consideration of the spatial relationships that are revealed by this reaction. Sections are included on the

cuprammonium-glycol reaction, spatial requirements for complexing, correlations between the reaction with cuprammonium and other reactions of carbohydrates, cuprammonium complexes and the structure of polysaccharides (including cellulose and starch), and cuprammonium complexes and the shape of pyranoside rings. 14 tables, 4 figures, and 66 footnotes. M.W.

CELLOPHANE

McINDOE, WILLIAM C. Cellophane industry in the West. Paper Ind. 33, no. 7: 780-84; no. 8: 934-6; no. 9: 1059-61 (October-December, 1951).

In a series of three articles, the possibilities of establishing a cellophane industry in the West are discussed. The first part of the article deals with available raw materials; the second, with the location of favorable plant sites, including labor supply, power, fuels, water supply, waste disposal, climate, and state taxes; and the third, with the abundance of large and stable markets. 6 tables, 3 diagrams, and 26 references. E.S.

CELLULOSE

FREY-WYSSLING, A. Electron-microscopic study of dissolved and precipitated cellulose. Makromol. Chem. 7, no. 2: 163-7 (October, 1951). [In German; English summary]

Because both viscose and cuprammonium rayon consist of submicroscopic strands of varying diameters which resemble fragments of the cell wall of the native cellulose from which they have been manufactured, a study of the submicroscopic homogeneity of cellulose solutions was carried out. It was found that the solutions contain no dissolved cellulose particles and that the heterogeneous nature of the rayons is a result of heterogeneous precipitation in the coagulating bath. 4 figures and 4 references. M.W.

STAUDINGER, HERMANN. Macromolecular compounds. [350] Cellulose. [104] Concerning the micellar or macromolecular structure of celluloses. Das Papier 5, no. 21/22: 438-45 (November, 1951). [In German] *cf.* B.I.P.C. 22: 250.

The developments since Nägeli's concept of the micellar structure of cellulose to the present theory of its macromolecular constitution are discussed with reference to the pertinent literature. The author suggests that the word "micelle" be eliminated entirely from modern cellulose chemistry, because the term was introduced by Nägeli under entirely different assumptions and at present causes only confusion. The characteristic phenomena of colloidal cellulose solutions as well as of solid cellulose fibers can be explained on the basis of the macromolecular structure. 10 tables, 9 figures, and 35 references. E.S.

CELLULOSE—CRYSTALLINITY

VERSEPUT, H. W. Studies of dielectric properties of chemical pulps. IV. The relationship between the dielectric constant and crystallinity of cellulose. Tappi 34, no. 12: 572-6 (December, 1951); *cf.* B.I.P.C. 20: 785-6.

Measurements of the dielectric constant were made at temperatures from 25 to 105°C. of purified cotton and wood fibers, cellophane, and regenerated fibers, including a high-tenacity viscose rayon, cuprammonium rayon, Fortisan-saponified acetate, and Fiber G. The Clausius-Mosotti relation was found to be valid for regenerated fibers. It was found that wet pressing of

handsheets of regenerated fibers, as well as of wood fibers, caused a considerable reduction in dielectric constant with little or no effect upon water-vapor accessibility. It is proposed that this reduction was due to secondary cross linkages between cellulose chain molecules within the amorphous zones. Pressing of handsheets at 4000 p.s.i. and room temperature produced a reduction in both dielectric constant and accessibility, and such pressing at about 110° resulted in similar but larger changes. It is believed that the failure of cellophane to have as large a dielectric constant as chemically similar regenerated fibers is due to the structure of the material itself, rather than to the manner in which it has been stored. The dielectric constant of cellulose has been shown to be profoundly influenced by crystallinity, as shown by comparison with measurements of ultimate density and water-vapor accessibility. At least a certain amount of the polarization seems to be due to the rotational vibration of cellulose chains within the amorphous zones but, since all amorphous material may not possess the same freedom of such rotation, this component of the polarization is not necessarily entirely dependent upon the quantity of amorphous material present. An interpretation of dielectric constant as a measure of crystallinity must be different from that placed on existing methods, since polarization is uniquely determined by the molecular structure. Dielectric-constant measurements may be of particular value in evaluating rapid changes in crystallinity. 2 tables, 4 figures, and 18 references. E.S.

CELLULOSE—DEGRADATION

GOLDTHWAIT, CHARLES F., BURAS, EDMUND M., JR., and COOPER, ALBERT S. Chemical substitution in fibrous cotton and resistance of substituted cotton to microbiological deterioration. Textile Research J. 21, no. 11 : 831-40 (November, 1951).

The resistance for months to deterioration by micro-organisms in soil-burial tests of suitably acetylated fibrous cottons, some with only one third of the hydroxyl groups substituted, depends upon the distribution of the acetyl groups as well as upon the total number of such groups present. Under usual conditions of acetylation, according to the literature, reaction takes place first in the amorphous cellulose and starts at the most accessible places. According to present experimental acetylations and special dyeing tests, the reaction (which is probably confined at first to the amorphous cellulose) takes place along fibers in various segments and throughout cross sections rather than as a layer increasing in thickness from the surface inward. At one-third substitution, the amorphous cellulose is converted to triacetate; the cotton fiber still contains about two thirds of the original cellulose, which is present as crystalline material surrounded by acetylated cellulose. The swelling capacity of the cotton in water is greatly reduced. Although the mode of attack by micro-organisms is not completely understood, they apparently begin at the most readily accessible amorphous cellulose. From the literature and the present experiments, the protection by partial acetylation is believed to result from the blocking of hydroxyl groups, the filling of spaces between chains in the amorphous cellulose, and the suppression of swelling. It represents a general method of rendering cellulose unsuitable, or at least inaccessible, as a food for micro-organisms. A relatively low degree of saponification may detract greatly from the rot resistance of a well-protected acetylated cotton because of the restoration of amorphous cellulose, with loss of blocking groups and a restoration of the swelling capacity. Partial methylation by treatment with formaldehyde may impart a moderate degree of rot resistance which probably results from the suppression of swelling by cross linking. The evidence obtained indicates that the amorphous cellulose is the part which is normally attacked and that its ability to swell in water may be a more

important factor in microbiological attack than is commonly recognized. 23 references. E.S.

SCHWERTASSEK, K. The effects of degradation processes. Fourth communication concerning the relationship of iodine sorption and the state of crystallization of cellulose fibers. Melliand Textilber. 32, no. 10: 774-8 (October, 1951). [In German] *cf.* B.I.P.C. 22: 46.

Chemical degradation increases the degree of crystallization in the cellulose of viscose fibers, whereas thermal deterioration has no such effect. The decrease of the iodine sorption (I) with aggressive chemical treatments is primarily caused by the dissolution of amorphous substance, whereas cellulose degradation caused by overdrying does not cause any change in (I). The possible applications of (I) for evaluating the type of degradation in different rayon fibers are discussed. 12 tables and 6 references. E.S.

CELLULOSE—HEMICELLULOSE

WHITING, G. C. Paper chromatography of flax fibre polyuronide hemicellulose. Nature 168, no. 4280: 833-4 (Nov. 10, 1951).

The sugar constituents of the polyuronide hemicellulose which occurs in flax fibers were investigated. After extraction, the hemicellulose constituent was prepared in a thin sirup for paper chromatography. The following solvent mixtures were used: (*a*) butanol-ethanol-water (4:1:5) and (*b*) (4:1.1:1.9), (*c*) butanol-acetic acid-water (2:1:1), and (*d*) ethyl acetate-acetic acid-water (3:1:3). Known sugar solutions were run simultaneously for identification purposes. Aniline hydrogen phthalate or *p*-anisidine hydrochloride were used as developers. Solvents (*a*) and (*b*) did not separate arabinose and mannose, but (*c*) and (*d*) showed the presence of both. All four solvents showed the presence of galactose, glucose, xylose, and rhamnose. No ketoses were detected. When a more concentrated sirup was used, two additional spots were observed with solvent (*c*) which were not identified. 8 references. M.W.

CELLULOSE—SORPTION

GAILEY, I. Causes of unlevel dyeing of cellulose; the influence of mercerising and bleaching processes on the fine structure of cellulose. J. Soc. Dyers Colourists 67, no. 10: 357-61 (October, 1951).

The worst types of unlevelness in dyeing are caused by the presence of certain impurities on the surface of the cotton; these impurities may be either inert substances which prevent the normal contact between the cellulose and the dye, chemically reactive substances which attract or repel dyes, and substances which exert no effect. Unlevelness of a less striking character can also be caused by differences in the sorptive capacity of the cellulose. The author shows that cellulose is fairly reactive and undergoes change readily. Any irregular treatment which the cotton may receive during mercerization, kier boiling, and drying can cause variations in the sorptive capacity of the material as a result of changes in the fine structure, such as percentage of crystallinity, orientation, type of crystal lattice, and size of crystallite. These variations in sorptive capacity are liable to cause unlevel dyeing. 5 tables, 2 figures, and 26 references. E.S.

CELLULOSE AS FODDER

LAWTON, E. J., BELLAMY, W. D., HUNGATE, R. E., BRYANT,

M. P., and HALL, E. Studies on the changes produced in wood exposed to high velocity electrons. Tappi 34, no. 12: 113-16A (December, 1951); *cf.* B.I.P.C. 21: 616-17.

Irradiation of basswood with high-energy electrons alters its structure such that the cellulose component becomes vulnerable to the attack of bovine rumen bacteria. The production of volatile acids, a measure of digestibility and fermentability by the rumen bacteria, shows a sharp increase to a maximum at an irradiation dose of 10^8 equivalent roentgen units and then a decrease at 3.3×10^8 roentgens. The analytical data indicate greater measurable action of the irradiation on the cellulose than on the lignin component of the wood. The formation of reducing sugars, in the case of the cellulose, with increasing dose would suggest a breakage of the fundamental glucose chain. The cellulose becomes completely soluble at 3.3×10^8 roentgens, at which point it can be estimated that the minimum chain length is approximately six $C_6H_{10}O_5$ units. The volatile acids from cellulose show a decrease at 3.3×10^8 roentgens. This correlates with the basswood data and probably indicates destruction to a degree such that the products are not as readily fermented. It is felt that the increase in digestibility with increased dosage is a measure of the destructive action of the irradiation on the protective power of the lignin toward the cellulose. At 10^8 equivalent roentgens the protective action is almost completely destroyed, and the volatile acids formed constitute 79% of the amount formed from an equal weight of filter paper. At this dosage the digestibility by rumen contents is comparable with that of hay. A reduction in particle size to the order of the cellular dimensions did not significantly alter the digestibility of the unirradiated wood, thus indicating that the protection afforded by the lignin is probably not in the form of an "encrusting layer" as often postulated. 4 tables, 3 figures, and 15 references. E.S.

CHEMICAL ENGINEERING—ESTIMATES AND COSTS

CLARKE, LOYAL. Cost estimates answer questions. Chem. Eng. 58, no. 12: 144-5, 150 (December, 1951).

Some examples of the use of cost estimates at various stages of a project are presented, and specific estimating methods are mentioned. 4 references. M.W.

CHEMICAL LITERATURE

LEWTON, LUCY O. The Special Libraries Association and literature searching. Chem. Eng. News 29, no. 49: 5125-7 (Dec. 3, 1951).

Some of the publications of the Special Libraries Association which provide valuable tools for a literature searcher in any of the various technical fields are described. 2 illustrations. M.W.

CHEMICAL PLANTS—LOCATION

INDUSTRIAL AND ENGINEERING CHEMISTRY. Resources for the chemical industry in the United States. Far West. Ind. Eng. Chem. 43, no. 12: 2647-93 (December, 1951).

A symposium is presented which includes discussions and data concerning the chemical resources of the area comprising California, Oregon, Washington, Idaho, Nevada, Utah, Arizona, Montana, and Wyoming. The authors and titles of the articles are as follows: Sawyer, Frederick G. Introduction, p. 2647; Parkhurst, G. L. Status of chemical industry—1951, p. 2648-50; Byrns, A. C., and Lohse, Fred. Raw material availability—101 references,

p. 2650-6; Riesbol, Herbert S. Water resources development—6 references, p. 2657-61; Heston, Walter C., and Fleischmann, Edwin. The power situation —6 references, p. 2662-9; Adams, William H. Transportation, p. 2669-72; Ewell, Raymond H. Markets for chemicals—4 references, p. 2673-7; Bacon, Vinton W., DeMartini, F. E., and Harris, R. R. Water pollution legislation and administration, p. 2678-86; and, Sawyer, Frederick G. Air pollution—40 references, p. 2687-93. 13 tables, 14 figures, and 3 maps. M.W.

CHEMICAL TESTING—CELLULOSE—NITRATE VISCOSITY

LINDSLEY, CHARLES H. The intrinsic viscosity of nitrocellulose. J. Polymer Sci. 7, no. 6: 635-52 (December, 1951). [French and German summaries]

The behavior of acetone solutions of nitrated cellulose (cotton, linters, wood pulp, and rayon) was investigated; viscometers of the Ostwald-Cannon-Fenske type and gravity flow were used. The concentration-viscosity range over which graphs of reduced viscosity are linear is greater than is frequently assumed and permits the graphical determination of intrinsic viscosity with good precision with simple apparatus. The effect of rate of shear on viscosity measurements was found to increase with D.P. at a given viscosity. Various equations used to calculate the intrinsic viscosity from the measurement of viscosity at one concentration only were examined, and the range over which they remain valid is shown. Intrinsic viscosities were determined in different solvents, mixtures of solvents, and mixtures of solvent and nonsolvent. The results are interpreted in terms of chain length and shape of the cellulose molecule in solution. 7 tables, 4 figures, and 13 references. E.S.

CHEMICAL TESTING—CELLULOSE ETHERS

BLACK, HENRY C., JR. Determination of sodium carboxymethylcellulose in detergent mixtures by the anthrone method. Anal. Chem. 23, no. 12: 1792-5 (December, 1951).

A method which is based on the green color formed by the reaction of anthrone with carbohydrate materials in sulfuric acid solution is described. The color intensity, which varies inversely with the degree of substitution (D.S.), is measured spectrophotometrically. Controlled heating is necessary for reproducible results, and the accuracy is 2% relative, provided the D.S. is known. Other carbohydrates, carbohydrate derivatives, furfural, 5-hydroxymethylfurfural, and certain polyethylene derivatives of fatty acids and phenols are known to be interfering substances. 3 tables, 6 figures, and 10 references. M.W.

SAMSEL, E. P., and DELAP, R. A. Colorimetric determination of methylcellulose with anthrone. Anal. Chem. 23, no. 12: 1795-7 (December, 1951).

A study of the solubility of Methocel (Dow methylcellulose) and the development of a quantitative method for its determination to be used in conjunction with the alkoxyl determination is reported. A colorimetric method in which anthrone is employed was developed and used to test the solubility of Methocel in water at 85 and 95°C. There was very little differences in solubility at the two temperatures; the high viscosity materials were almost insoluble at these temperatures. The solubility data are useful in cases where Methocel is to be separated from other materials which are soluble in hot water. The colorimetric method is useful for the determination of Methocel incorporated with other materials that would interfere with the methoxyl determinations. 2 tables, 2 figures, and 9 references. M.W.

CHEMICAL TESTING—PULP—ACID NUMBER

ANT-WUORINEN, OLLI, and VISAPÄÄ, ASKO. The effect of the cation exchange capacity of glass material on the carboxyl group titration values of cellulose. Paper and Timber (Finland) 33, no. 11: 336-7 (November, 1951). [In English] *cf.* B.I.P.C. 21: 769-70.

Reference is made to the base-exchange capacity of the glass surfaces of the equipment used in the determination of the carboxyl groups in cellulose described in the previous article and to its effect on the titration values. Since the base-exchange capacity of different glass qualities may vary considerably, those of the suction funnel with sintered bottom used in the experiments were determined, and the values of the results were recalculated. The original mean values of the previous article and those corrected on the basis of the ion-exchange capacity of the funnel (so-called funnel constant) are given. The need for such a correction is stressed. 3 tables and 7 references. E.S.

CHEMICAL TESTING—PULP—ALPHA CELLULOSE

WELLER, KARL. The determination of α-cellulose. Reyon, Synthetica, Zellwolle 29, no. 7: 268-70 (July, 1951). [In German] *cf.* B.I.P.C. 22: 8.

The author confirms the shortcomings of the α-cellulose determination as pointed out by Jentgen in his recent article and mentions several modifications which are aimed at improvements. The safest method for evaluating the fiber yield to be expected from a dissolving pulp is the conversion of a sample batch under standardized conditions and weighing of the resulting amount. In addition to the α-cellulose content, other factors of significance are the percentages of moisture, wood gum, lignin, resin, ash, iron, silicic acid, and lime, filtering properties, cuprammonium viscosity, and basis weight, all of which exert an influence during the conversion from pulp to rayon. Every expert knows that pulps which fulfill the minimum requirements in this respect, but which were prepared by either the sulfite, sulfate, or nitric acid process, will behave differently during manufacture, and some of them cannot be converted at all. Although much has been written on this subject during recent years, the problem of pulp evaluation for rayon manufacture has not yet been solved satisfactorily. 3 references. E.S.

CHEMICAL TESTING—PULP—CAUSTIC SOLUBILITY

BARTUNEK, R. The value of caustic-solubility determinations of pulps. Reyon, Synthetica, Zellwolle 29, no. 9: 361-2 (September, 1951). [In German] *cf.* B.I.P.C. 22: 8.

With reference to Jentgen's recent critique of the value of the α-cellulose determination, the author postulates that the most recent German standard method for determining the 18% caustic solubility of pulp avoids hemicellulose losses by washing with 10% acetic acid and that the value for the insolubility in 18% caustic soda is equivalent to the actual pulp yield. The suitability of solubilities in 10 and 18% caustic soda for evaluating the quality of a pulp (i.e., strength and other textile properties of the rayon prepared from the pulp) is discussed, and it is shown that the permissible amounts of residual hemicellulose (difference between the two solubilities) vary with different pulp treatments; for instance, 3% residual hemicellulose is beneficial in hot-purified pulps, and harmful in cold-purified ones. In conclusion, the author points out that it would be premature to discard the α-cellulose determination as developed in its latest modification (the new Merkblatt of Zellcheming). E.S.

CHEMICAL TESTING—PULP—CUPRAMMONIUM VISCOSITY

CONRAD, CARL M., TRIPP, VERNA W., and MARES, TRINIDAD. Intrinsic viscosities of cellulose as affected by rate of shear. J. Phys. & Colloid Chem. 55, no. 9: 1474-91 (December, 1951).

Data are presented on the application of Martin's equation for the determination of intrinsic viscosity (I) to a series of seven celluloses which represent D.P.'s estimated to range from 500 to 5000. In each case the viscosity determinations were made in both cuprammonium and cupriethylenediamine solvents, and the results were read from curves at a velocity gradient (II) of 300, 500, and 2000 sec.$^{-1}$. For comparison, (I) was also computed from viscometer readings taken without regard to (II). It is shown that, although with celluloses of low D.P.'s (I) is unaffected by (II), at D.P.'s of about 1000 (I) began to vary progressively with (II) and to decrease as (II) increased. Where the results showed dependence on (II), Martin's plot of log η_{sp}/c vs. c for observations at uncontrolled (II) had higher slopes and crossed the curves which represented controlled (II) and gave lower (I). The maximum range of (I) which resulted from the choice or nonchoice of (II) occurred with highest D.P.'s and amounted to 25% for cuprammonium and 28% for cupriethylenediamine. In the range of higher D.P.'s the Philippoff and Fikentscher equations lead to a much lower (I) than does Martin's equation. Values for (I) in both solvents were related linearly with a ratio of cupriethylenediamine to cuprammonium of 1.365. It was also shown that Martin's slope constant, K, is inversely related to (I), with increasingly greater slope as (II) increases. 2 tables, 11 figures, and 23 references. M.W.

CHEMICALS

CALKIN, JOHN B. New uses for paper chemicals. Paper Mill News 74, no. 49: 26-7, 94 (Dec. 8, 1951).

Several new uses for chemicals in the improvement of paper properties are mentioned, including the development of wet strength and increased pigmentation. Reference is also made to various types of hot-melt coatings and the flameproofing of paper. M.W.

PAPER MILL NEWS. Chemicals in paper making. Paper Mill News 74, no. 49: 28, 30 (Dec. 8, 1951).

A list of papermaking chemicals is presented, and the NPA availability ratings are included for several of them. M.W.

CHITIN

DARMON, S. E., and RUDALL, K. M. Infra-red and x-ray studies of chitin. Discussions Faraday Soc. no. 9: 251-60 (1950).

The absorption spectra of chitin, chitosan, chitin nitrate, and wood cellulose have been recorded in the region of 3600 to 750 cm.$^{-1}$ with the use of polarized radiation. A preliminary interpretation of the spectra, in conjunction with the x-ray data, has added to the knowledge of the detailed structure of chitin. The principal feature is hydrogen bonding between CONH groups of adjacent amino-acetyl side chains to form linked piles of chitin chains within the crystalline regions. However, consistent with the particular symmetry, this type of linkage seems to occur between only some of the amino-acetyl groups (presumably half of them). The remaining acetyl groups are bonded differently, and the evidence points to a linkage of the type CO—HO. As a result of the progressive deacetylation which occurs during chitosan formation, the principal interchain bonding is of the type

OH—OH, as in cellulose. The results of these investigations form a basis for an understanding of the role of *N*-acetylhexosamines in the interchain bonding of polysaccharides. 7 figures and 13 references. M.W.

CHLORINE

EICHENHOFER, H. J., and FEDOROFF, V. N. Chlorine liquefaction modernized. Chem. Eng. 58, no. 12: 142-3 (December, 1951).

The centrifugal refrigeration unit for the liquefaction of chlorine in which Freon is employed as the refrigerant is described and compared with a reciprocating refrigeration system in which carbon dioxide is used. The Freon centrifugal system is shown to require less space, less power, and less maintenance, to lose less refrigerant, and to be easier to install than the carbon dioxide system. 4 illustrations. M.W.

CHROMATOGRAPHY

BURMA, D. P., and BANERJEE, B. The role of cellulose in filter-paper chromatography. Science and Culture 15: 363-4 (1950); C.A. 45, no. 9: 3753 (May 10, 1951). [Abstract only available]

Experimental results show that cellulose may not play a completely passive role in paper chromatography. The effect of partition was precluded by using pure water as a solvent for 15 α-amino acids and seven sugars in runs employing the usual ascending and descending techniques. Constant and reproducible R_f values in the range 0.80-0.95 were obtained for all compounds tested (except tryptophan, 0.57) which indicates a weak, but definite absorption. When water-saturated solvents are used in paper chromatography, it can therefore hardly be assumed that differential absorption is completely negligible. E.S.

CLAY

KEENAN, A. G., MOONEY, R. W., and WOOD, L. A. The relation between exchangeable ions and water adsorption on kaolinite. J. Phys. & Colloid Chem. 55, no. 9: 1462-74 (December, 1951).

The adsorption of water at 20°C. has been studied on homoionic kaolinites which contained a series of monovalent and divalent exchangeable cations in known amounts. By applying the Brunauer, Emmett, and Teller theory to the data and correlating the results with low-temperature measurements of surface area by the use of nitrogen, a quantitative measure has been obtained of the extent to which the various ions affect the water adsorption. It is pointed out that, at the low water contents dealt with here, the usual concepts of a closely co-ordinated hydration shell may not apply to ions which may be at least partially buried in the surface layers of a crystal lattice. It was found that lithium ion has no effect on water adsorption. This is presumably due to the fact that its size is just such that it fits into a position in the surface of the kaolinite crystal in which it is sterically hindered from influencing the adsorption. The hydrogen ion, because of its large energy of hydration, is pulled out of the lattice and increases the adsorption. The other monovalent ions studied, although they have less energy of hydration than hydrogen ion, are all larger than lithium ion and do not fit into the same sheltered position. They cause small but measurable increases in water adsorption; sodium ion shows the largest effect. The divalent ions studied, in addition to being larger than lithium, also have higher energies of hydration (which results from their double charge) and increase the water adsorption markedly. 3 tables, 6 figures, and 26 references. E.S.

COLOR

HURVICH, LEO M., and JAMESON, DOROTHEA. A psychophysical study of white. III. Adaptation as variant. J. Optical Soc. Am. 41, no. 11: 787-801 (November, 1951); *cf.* B.I.P.C. 22: 11.

Experimental data are presented which provide psychophysical specifications of white in terms of the stimulus variables, color temperature, and luminance, for 10 different adaptive conditions. A single-test field size, 11.7°, and a single exposure time, one second, were used. The color temperatures of the adapting and surrounding illuminations were: 10,000, 7500, 5500, 4300, and 2842°K.; and the adapting luminance levels were 5 and 15 millilamberts. The white threshold contours exhibit minima in all cases, and vary systematically with both the color temperature and luminance of adapting and surround field. These variations are analyzed and discussed in terms of chromatic desensitization. Various principles and mechanisms of color vision are discussed in relation to the psychophysical functions presented in the three papers of this series. It is suggested that the properties exhibited by these functions are most simply interpreted by postulating an independent white mechanism. 2 tables, 8 figures, and 38 references. E.S.

CONTAINER INDUSTRY

ORGANISATION FOR EUROPEAN ECONOMIC CO-OPERATION. The American folding set-up and corrugated box trades. Paper Box Bag Maker: 146-8, 150 (October, 1951).

A section of the complete O.E.E.C. report, "The pulp and paper industry in the U.S.A." (*cf.* B.I.P.C. 22:308-9) is presented. The production, use, and advantages of folding and setup boxes are discussed, and the methods and materials which are used in the production of corrugated containers are described. M.W.

CORROSION

DRAVNIEKS, ANDREW. Corrosion of steel in molten sulfur. Ind. Eng. Chem. 43, no. 12: 2897-900 (December, 1951).

The simplest case of the basic corrosion reactions of steel vessels by hot sulfur-bearing media is discussed in the present article. Between 300 and 450°C. the corrosion of steel in sulfur is limited by two processes, one a chemical and the other a mechanical one. A thin film which consists principally of ferrous sulfide grows by diffusion of reactants, presumably iron ions, through the film. The rate of corrosion is inversely proportional to the thickness of the film. With increasing thickness, mechanical strains produce a film rupture followed by a temporary local acceleration of attack. Kinetic constants of the reaction are given, and the film structure is described. The fundamental mechanisms in sulfide formation on steel in molten sulfur are explained; this instance of corrosion falls into the type of film-growth reactions which are complicated by a cracking-heating process. 1 table, 9 figures, and 14 references. E.S.

FLYNN, F. W. Digester corrosion. Pulp & Paper 25, no. 13: 50, 52 (December, 1951); *cf.* B.I.P.C. 21: 462.

The author reports the highlights of the TAPPI Digester Corrosion Subcommittee meeting in Savannah, including a new instrument which employs Co^{60} for measuring digester-wall thickness, different digester linings (Inconel, carbon brick), the effect of stray currents, the reporting of corrosion rates, and the availability of steels. E.S.

PARKER, IVY M. The literature on corrosion. Corrosion 7, no. 12: 450-4 (December, 1951).

The National Association of Corrosion Engineers has secured the permission of established abstracting agencies in various fields to collect, classify, and publish abstracts on corrosion. A filing system index to co-ordinate corrosion literature has been developed which is based on the use of punch cards. The coding system used with the punch cards is described, and lists of books on corrosion and on paints and coatings are included. 1 table, 1 figure, and 33 references. M.W.

COST—ACCOUNTING

ELLIOTT, NORMAN J. Cost records are a worthwhile investment. Boxboard Containers 69, no. 708: 19-21 (December, 1951).

The advantages of organized cost procedures and records for large as well as small business units are outlined. E.S.

DIALYSIS AND DIALYZERS

MARSHALL, R. D., and STORROW, J. ANDERSON. Dialysis of caustic soda solutions. Ind. Eng. Chem. 43, no. 12: 2934-42 (December, 1951).

The use of either dialysis or electrodialysis as a method of separation and purification has, in general, been confined to laboratory experiments and small-scale industrial processes, with the exception of its application in the manufacture of viscose rayon where caustic soda is recovered from the steeping liquor contaminated with about 5% hemicellulose. The present work was undertaken to develop the theoretical basis and derivation of dialysis coefficients, and to study the relationship between local and over-all coefficients in the countercurrent dialysis of caustic soda solutions over the concentration ranges employed in the industrial recovery process. Concentration distributions have been measured in the continuous countercurrent dialysis of 20% (by weight) sodium hydroxide solutions to assess the mass transfer in terms of dialysis coefficients appropriate to specific positions along the contact path. A comparison of exact and approximate methods for the calculation of over-all coefficients shows that, for design purposes, it is adequate to use an over-all coefficient based on the logarithmic mean of the terminal concentration differences between the liquor and the water cells. Relative resistances to transfer in the liquor "films" and in the membrane have been assessed for various positions on the membrane, and it is shown that the reduction of either resistance will increase the over-all dialysis coefficient. From these analyses approximate design methods are suggested. 6 tables, 9 figures, and 46 references. E.S.

DIFFUSION

BABBITT, J. D. On the diffusion of adsorbed gases through solids. Can. J. Physics 29, no. 5: 437-46 (September, 1951); *cf.* B.I.P.C. 21: 10-11.

The equations for the diffusion of an adsorbed gas through a solid are developed on the assumption that the resistive force is directly proportional to the number of molecules adsorbed, i.e., that the resistive force per molecule is constant. The equations are compared with experimental data and also with the equations developed in an earlier paper, where the assumption was made that the resistive force per molecule is inversely proportional to the num-

ber of molecules adsorbed. The present equations are not as satisfactory as those developed earlier, and it is pointed out that this is a consequence of the fact that heats of adsorption have been found experimentally to decrease as the amount of adsorbed gas increases. 4 figures and 7 references. E.S.

BABBITT, J. D. A unified picture of diffusion. Can. J. Physics 29, no. 5: 427-36 (September, 1951); *cf.* B.I.P.C. 21: 10-11.

The author shows that if the equation $D_x(p) - Ax = 0$, where p is a pressure function, Ax a resistive or frictional force, and $D_x(p)$ the partial derivative of p with respect to x, is taken as a fundamental dynamic equation, it is possible to explain diffusion in solutions, in solid solutions, and in any adsorbing solid, as well as the interdiffusion of two gases. In diffusion in both liquid and solid solutions the pressure function is the osmotic pressure; in the diffusion of adsorbed gases the pressure function is the spreading pressure of the adsorbed layer. Since these pressure functions are thermodynamic properties of the system, the pressure gradient is independent of the physical picture assumed for the system. To evaluate Ax, however, it is necessary to assume a specific physical mechanism for the movement of the molecules. 8 references. E.S.

DYES AND DYEING

SELLING, H. J. Colorimetry and its application in the textile industry. Textil-Rundschau 6, no. 11: 498-508 (November, 1951). [In German] *cf.* B.I.P.C. 21: 85-6.

The contents of the article are very similar to those of the previous reference. 4 tables, 13 figures, and 12 references. E.S.

SNEDEKER, DAVID B. Dyestuffs in paper making. Paper Mill News 74, no. 49: 71-2, 74, 76, 78 (Dec. 8, 1951).

The factors which may influence the color of a final sheet are enumerated, and some suggestions concerning the control of these factors so that uniform results may be obtained are given. M.W.

EVAPORATION AND EVAPORATORS—SULFITE WASTE LIQUOR

JACOBY, HAROLD E. Sulfite evaporation; new report on Swedish operation. Pulp & Paper 25, no. 13: 100, 102-3 (December, 1951); *cf.* B.I.P.C. 20: 786.

A summary of the author's impressions during a recent trip to Sweden is presented, covering the contrast between Swedish and U.S. requirements for the removal of spent sulfite liquor, temperature limitations, types of Swedish equipment, channel-switching types, optimum concentrations, and maintenance problems. The author concludes that the experience of Swedish practices in the evaporation of spent calcium-base sulfite liquor indicates that successful results can also be achieved under conditions prevalent in the United States. Station switching of the Rosenblad-type evaporator will permit seven-day operation per week within proper temperature and pressure limitations. For refractory-type furnaces a liquor concentration can be readily achieved which will give good combustion. The materials of construction are standardized, and maintenance is normal. 2 figures. E.S.

FIBER—ANALYSIS

CATTLETT, MAMIE S., GIUFFRIA, RUTH, MOORE, ANNA T., and

ROLLINS, MARY L. Microscopical observations on the contents of the cotton fiber lumen. Textile Research J. 21, no. 12: 880-6 (December, 1951).

A method is described for isolating the lumen contents of the cotton fiber by digestion of the cellulose in chilled 72% sulfuric acid. Microscopical observations on the isolated lumens as well as the lumen in the whole fiber are reported. The isolated lumens appeared tubular, and electron micrographs of thin sheets of the membrane material showed an unoriented granular structure. The lumen residue isolated by sulfuric acid was found to be completely hydrolyzed by 1% sodium hydroxide, but only partly hydrolyzed in dilute mineral acid. Amino acid determination by paper chromatography disclosed no free amino acids in the lumen material, but several were found in the hydrolyzed sample. 8 figures and 21 references. M.W.

TRIPP, VERNE W., MOORE, ANNA T., and ROLLINS, MARY L. Some observations on the constitution of the primary wall of the cotton fiber. Textile Research J. 21, no. 12: 886-94 (December, 1951).

The primary wall of fully matured cotton fibers has been isolated and its morphology and composition studied by electron-microscopic examination and by chemical analyses. The primary wall appears to contain about 50% cellulose; protein, wax, and pectic substances occur in lesser amounts. Cutin or suberin and mineral matter are also present. The concentration of noncellulosic substances in the primary wall is much greater than in the whole fiber. Electron-microscopic examination of the primary wall indicates that it consists of a network of cellulose fibrils with diameters of 100 to 400 A. which are surrounded by the noncellulosic constituents. The oriented fibrillar systems observed with the polarizing microscope have not been seen in the electron micrographs of the specimens studied. There is an apparent increase in the diameter of the fibrils of the primary wall and in the denseness of the network as the fiber matures. The existence of layers in the cellulose network has been observed. 1 table, 10 figures, and 25 references. M.W.

FIBER—DIMENSIONS

BISSET, I. J. W., and DADSWELL, H. E. The variation in cell length within one growth ring of certain angiosperms and gymnosperms. Australian Forestry 14, no. 1: 13 p. (1950); *cf.* B.I.P.C. 20: 560; 21: 163.

The variation in cell length within one growth ring at the one level has been studied in 28 angiosperms and eight gymnosperms. In those angiosperms with distinct growth rings a definite increase in fiber length has been found from the first-formed early wood to the last-formed late wood within the one growth ring; in species without definite growth rings little or no variation in fiber length has been observed over radial distances covering the growth of several years. The relationship between these changes in cell length and growing conditions is discussed. In gymnosperms a slight but definite increase in tracheid length from early to late wood was noted in most cases. Where compression wood was present, a definite drop in tracheid length occurred. 1 table, 34 figures, and 17 references. E.S.

FIBER—IDENTIFICATION

TEXTILE INSTITUTE. *Unification of Testing Methods Committee. General Technical Committee "C."* Identification of textile materi-

als. J. Textile Inst. 42, no. 10: S25-114 (October, 1951); *cf.* B.I.P.C. 18: 670.

This is third edition of the testing methods developed by Committee "C" for the identification of textile fibers, either individual or in mixtures. Following a brief description of the characteristics of natural (animal and vegetable) and manufactured fibers (regenerated cellulose, cellulose acetate, regenerated protein, alginate, synthetic polymer, and miscellaneous fibers, including asbestos and glass fibers and paper yarns) and brief directions for some of the tests, the following analytical tables are presented: I, preliminary analysis of materials with the aid of the microscope; II, analytical scheme for the identification of textile materials; III, preliminary analysis of materials without using the microscope; IV, density; V, dimensions of some animal and vegetable fibers; and VI, burning test. This is followed by a series of photomicrographs depicting the appearance of cross sections and entire fibers which have been carefully selected to illustrate typical examples. A four-page index concludes the article. 6 tables and 64 photomicrographs. E.S.

FIBER—STRUCTURE

FREY-WYSSLING, A. The fusion of cellulose microfibrils to ribbonlike structures in plant cell walls. Holz Roh- u. Werkstoff 9, no. 9: 333-4 (September, 1951). [In German]

The crystallized cellulose in plant cell walls consists of discrete microfibrils of a diameter of approximately 250 A.; each microfibril consists of about 2000 parallel cellulose-chain molecules. In addition to the crystalline ranges, also less well-arranged, paracrystalline regions are present. The fact is mentioned that during natural growth the cellulose aggregates always comprise approximately the same number of molecules, and no collective crystallization of the formed microfibrils takes place, whereas during the precipitation of regenerated fibers, much coarser and thicker fibrils are formed. The principal reason for the noncontact of the microfibrils in the primary cell wall is the very low cellulose content (92.5% water and only 2.5% by weight of cellulose). When the microfibrils come sufficiently close to each other, a fusion to ribbons is possible. Such a fusion was first observed in the bacterial cellulose of *Bacterium xylinum;* however, the author and co-workers also succeeded in detecting such fusions with the electron microscope in plant cell walls of tulip pulps and the parenchyma of the ash tree. 4 electron micrographs and 13 references. E.S.

FREY-WYSSLING, A., and STECHER, H. The growth in area of plant cell walls. Experientia 7, no. 11: 420-1 (November, 1951). [In German]

The growth in area of plant cell walls consists in the loosening of local fields of the tubular texture of microfibrils. The loosening is probably caused by the intensive growth of local plasma which pushes the existing microfibrils aside. This growth by the extension of local spots is termed mosaic growth. 2 electron micrographs and 4 references. E.S.

FIBER—TESTING

HERTEL, K. L., and CRAVEN, C. J. Cotton fineness and maturity as measured by the arealometer. Textile Research J. 21, no. 11: 765-74 (November, 1951); *cf.* B.I.P.C. 20: 786-7; 21: 164.

The theory and development of the arealometer are presented, and some preliminary tests are reported. They indicate that the increase in apparent

specific area as observed on the arealometer at low porosity over that at high porosity is correlated with the immaturity of the cotton. A suggested explanation which is based on the reorientation of idealized oblong fiber sections is approximately true over the limited range of cottons tested. The method provides a quick measure of both fineness and immaturity from two readings of the arealometer with a coefficient of variation of 2% or less for the specific area and 5-10% in the immaturity ratio. 8 figures and 8 references. M.W.

FORESTS AND FORESTRY

JOHNSON, R. S. Mersey Paper Company's experience with partial and selection cutting. Pulp Paper Mag. Can. 52, no. 12: 132, 134 (November, 1951).

The author reports favorably on the results of partial and selection cutting in even-aged and all-aged spruce stands. The importance of strict control of marking so that only a definite percentage of the merchantable volume is removed is stressed. 1 table. M.W.

WRIGHT, C. E. Buckeye Cellulose carries on. Paper Trade J. 133, no. 22: 49-50 (Nov. 30, 1951).

The Buckeye Cellulose Corp. has recently purchased the Brooks-Scanlon forest in northwestern Florida. The forest management methods which have been developed by Brooks-Scanlon and which will be continued by Buckeye are described. They include timbering, cruising, replanting, patrol work, and fire fighting. 1 illustration. M.W.

FUEL

MYERS, DAVID MOFFAT. Comparison and selection of fuels. Paper Ind. 33, no. 9: 1053 (December, 1951); *cf.* B.I.P.C. 22: 281.

The author discusses the important factors which should be taken into consideration when the selection for a new furnace or a change of fuel in an existing installation is made; it is usually wise to design the boiler to burn at least any two of the available fuels. A chart giving the cost per million B.t.u. of the three most common boiler fuels (bituminous coal, natural gas, and fuel oil) is included to facilitate a comparison, and the use of the chart is explained. 1 chart. E.S.

FURFURAL

NEWTH, F. H. The formation of furan compounds from hexoses. Advances in Carbohydrate Chem. 6: 83-106 (1951).

Recent information and theories concerning furan compounds derived from hexoses and hexose acids, possible mechanisms of the formation of furan derivatives, and the preparation, properties, and reactions of 5-hydroxymethylfurfural are reviewed. 1 table and 90 references. M.W.

HARD WOODS

CHITTENDEN, A. E., COOMBER, H. E., and MORTON, D. Brachystegia wood from Tanganyika as a paper-making material. Colonial Plant and Animal Prod. 2, no. 1: 27-35 (1951); World's Paper Trade Rev. 137, no. 1: 33-6 (Jan. 3, 1952); *cf.* B.I.P.C. 22: 105.

Two samples of *Brachystegia* wood were investigated and found to have very similar properties. The heartwood and sapwood of *B.* (I) were clearly differentiated; the sapwood was of a light buff color and the heartwood a dark

reddish brown. The heartwood and sapwood of *B.* (II) were not clearly differentiated, and the general color of the wood was light russet brown. Pulping experiments on the two woods gave the following results: The wood possesses a fairly satisfactory cellulose content, but the average length of the ultimate fibers places it in the category of short-fibered materials for papermaking purposes. To obtain a well-digested pulp by the soda process, rather severe cooking conditions were required, and the consumption of soda was high. All the pulps were weak in character, and pulp yields were only moderate. Under standardized conditions of single-stage hypochlorite bleaching, the pulps required very severe treatment to give reasonably bleached pulps. The loss of pulp on bleaching was satisfactorily low, and the pulps suffered little deterioration. In general, the papers prepared from all the pulps were soft, bulky, and rather attractive in appearance. The presence of minute brown and black specks in the papers made from the bleached pulps is, however, an undesirable feature. (II) yielded paper of rather poorer appearance than (I). Both the unbleached and bleached pulps showed a very poor response to beating. The very low α-cellulose and very high β-cellulose figures obtained for both samples indicate that the timber would be quite unsuitable for the manufacture of dissolving pulps. 5 tables and 4 figures. E.S.

HAGGLUND, SVEN-ERIK. High-yield pulps from hardwoods using the conventional cooking methods and multistage bleaching. Tappi 34, no. 12: 545-7 (December, 1951).

By using conventional methods of cooking—preferably calcium bisulfite and kraft—a number of semidelignified pulps were prepared from different species of hardwood. These pulps were bleached to a high brightness by a multistage bleaching procedure. The resulting high-yield bleached pulps as well as the unbleached ones had remarkably high strength properties. The influence of cooking and bleaching variables and other factors was investigated, and the properties of the end product compared with neutral sodium sulfite semichemical pulps. 2 tables, 2 figures, and 1 reference. E.S.

VILLARS, J. The manufacture and utilization of hardwood pulps. Rev. papiers et cartons 14, no. 20: 621-4 (Nov. 15, 1951). [In French]

The author reviews the present status of mechanical, semichemical, and chemical processes which utilize hardwoods either in the form of logs or chips and problems involved in the manufacture of pulps and papers therefrom (including stream pollution), with particular reference to their applicability to French conditions. E.S.

HEATING

BROLA, G. A study on heat transmission by forced convection. Bull. assoc. tech. ind. papetière 5, no. 6: 297-307 (September, 1951). [In French]

On the basis of theoretical considerations and his own practical experiments, the author concludes that for best results with heat exchangers at high rates of gas circulation the tubes (exchange surfaces) should run parallel with the gas stream, and transverse to it if the gas circulates at low speeds. 8 figures. E.S.

HEATING (INFRARED)

WESTBROOK, FRANCIS A. Infra-red drying steps up efficiency. Printing Equip. Engr. 82, no. 3: 61-4 (December, 1951).

Following a brief discussion of the basic principles involved in infrared

drying, some examples of the use in the graphic-arts industry of electrical infrared drying with glass-enclosed filaments, metal-sheathed heating elements, and open-glow heating elements are described. Reference is made to the treatment of paper piles with wavy edges just before going to press so that the sheets will run without wrinkles. 8 figures. M.W.

HEMLOCK

FOSTER, R. E., and FOSTER, A. T. Studies in forest pathology. VIII. Decay of western hemlock on the Queen Charlotte Islands, British Columbia. Can. J. Botan. 29, no. 5: 479-521 + 6 plates on 3 leaves (October, 1951).

An investigation of western hemlock (*Tsuga heterophylla* [Raf.] Sarg.) showed that decay losses amounted to 13.9, 8.0, and 10.7% of the gross volume of grades 1, 2, and 3 logs, respectively. Total loss, including dead trees, amounted to 25.5% of the gross volume. Twenty-seven decay-producing fungi have been isolated. Scars provided the most frequent, and roots the most important, avenue of entrance for decay. The logs of 2318 western hemlock trees were analyzed in detail. Decay was found to increase progressively with diameter, age, and decreasing site quality. The maximum net periodic increment was reached between 350 and 400 years of age and between 35 and 40 inches in diameter. The color of the bark was found to provide an added indication of tree maturity. Understory trees were found to give a substantial yield of sound wood. 20 tables, 34 figures, and 28 references. E.S.

HISTORY

NIXON, T. H. W. The war years of William Nash, papermaker of St. Pauls Cray, Kent, England. Paper Trade J. 133, no. 22: 117-22, 128, 130, 167-70, 213-18, 233-6, 247-50 (Nov. 30, 1951).

A chapter from the book, "William Nash of St. Paul's Cray, papermakers," by W. S. Shears is reprinted, which consists of a diary in which the activities and difficulties of the mill during the war years are related. M.W.

HYDROGEN PEROXIDE

CHEMICAL WEEK. Peroxide progress. Chem. Week 69, no. 26: 27-8 (Dec. 29, 1951).

In recent years hydrogen peroxide bleaching has been employed extensively not only in the textile industry, but also in the pulp industry where the development of peroxide bleaching methods for groundwood pulps has made possible their utilization in higher-cost papers. Research in the pulping industry is now focused on the development of satisfactory and economical peroxide bleaching procedures for chemical pulps. Peroxide has also recently achieved prominence as a commercial-scale process oxidizing agent, and several new applications for it in the field of organic synthesis are mentioned. M.W.

INORGANIC PAPER

ANON. Paper from glass fibers. Tech. News Bull. Natl. Bur. Standards 35, no. 12: 177-8 (December, 1951); Chem. Eng. News 29, no. 52: 5456-7 (Dec. 24, 1951).

Paper which is composed entirely of glass fibers, with no additive, has been made at the National Bureau of Standards in co-operation with the Naval Research Laboratory. The raw material, commercially available fine glass fibers, was mixed with water and formed into continuous sheets on a semi-

commercial papermaking machine. A 1% glass concentration in the glass-and-water beater stock produced a stronger paper than higher concentrations, but a further dilution had no advantage. Short beating times were best. Experiments indicate that the paper strength depends on the presence of fibers of assorted lengths, but that very short fibers weaken the paper if present in substantial quantities. The paper possesses high resistance to heat, moisture, chemicals, and micro-organisms, and has excellent electrical characteristics. Suggested applications include its use in filters for gas masks and respirators and as an insulator and dielectric. 3 illustrations and 1 reference. M.W.

IONOGRAPHY

PENISTON, QUINTIN P., AGAR, HILDA D., and MCCARTHY, JOSEPH L. Ionophoretic analyses in agar gels. Anal. Chem. 23, no. 7: 994-9 (July, 1951).

An ionophoretic procedure is described which provides a method for the analysis and characterization of mixtures of low-molecular weight ionic substances of similar chemical behavior. The ionic components of a sample mixture are made to migrate from an initial short sample section through an agar gel in a long straight tube under constant electrical potential gradient so that distances migrated are proportional to net mobilities. Under favorable conditions approximately complete separation of the components is achieved which permits a quantitative determination of the individual solutes and characterization by measurement of absorption spectra and diffusion constants. The method requires relatively inexpensive apparatus, limited expenditure of time, and very small quantities of material (as little as 10 micrograms). It has been applied to mixtures of dialyzable lignosulfonic acids and to mixtures of guaiacol, acetovanillone, vanillin, and vanillic acid. Quantitative determination of these phenols to within 5% accuracy has been found possible by the integration of optical density patterns together with a knowledge of appropriate extinction coefficients and of the calibration of migration tubes. 1 table, 7 figures, and 15 references. M.W.

MACHINERY

WILLIAMS, A. E. Metal deposition in renovating equipment. World's Paper Trade Rev. 136, no. 16: 1121-4, 1129-31 (Oct. 18, 1951).

The use of metal deposition for the renovation of papermaking and printing cylinders, gears, and pumps by either metal spraying or electrochemical deposition is described; examples of applications are given. 9 figures. E.S.

MACHINERY—BLOWERS

SPRECHER, J. The extraction of water on paper machines by the Sulzer method. Textil-Rundschau 6, no. 9: 410-17 (September, 1951); *cf.* B.I.P.C. 18: 524.

The description of the application of Turbair blowers in the wet end of the paper machine is very similar to that of the previous reference. 12 figures. E.S.

MACHINERY—CALENDERS

BERGEN, J. T. Thermal effects in calendering viscous fluids. J. Applied Mechanics 18, no. 4: 425 (December, 1951); *cf.* B.I.P.C. 21: 555.

The author discusses the previous paper and presents additional evidence

for the existence of an isothermal at the surface of the calender roll. 6 footnotes. M.W.

CANADIAN PULP AND PAPER ASSOCIATION. *Technical Section. Newsprint Committee.* Calender stack operation. Pulp Paper Mag. Can. 52, no. 12: 112-15 (November, 1951).

Information regarding calender-stack operation received in answer to a questionnaire is presented in tabular form. 4 tables. E.S.

MACHINERY—CONVERTING MACHINERY

CONTAINER CORPORATION OF AMERICA. Award for printer-slotter feed roll guard. Fibre Containers 36, no. 12: 146-7 (December, 1951).

A feed-roll guard for a Langston printer-slotter is described and illustrated; the guard was developed by Louis Goldsmith and H. F. Drnec and won a safety award during the recent National Safety Congress in Chicago. 2 figures. E.S.

SAMUEL M. LANGSTON COMPANY, *Camden, N.J.* Semi-automatic box gluing machine. Fibre Containers 36, no. 12: 147-8 (December, 1951).

A brief reference is made to a new semiautomatic machine for the manufacture of glued-lap boxes with the flap either on the inside or outside of the box. The machine can be operated by girls who have been accustomed to running semiautomatic stitchers or tapers. The new glued-lap joint is claimed to be meeting rapid acceptance, particularly for high-compression strength boxes. 2 illustrations. E.S.

MACHINERY—CORRUGATING MACHINE

CASSADY, R. T. Corrugated superintendent's problems and hopes. Fibre Containers 36, no. 12: 130-2; discussion: 132 (December, 1951); *cf.* B.I.P.C. 21: 851.

This refers to the same article as listed in the previous reference; however, considerably more details are given. E.S.

MACHINERY—CUTTERS

MAUNDERS, E. C. A pulp sample cutter; a 1950 gadget competition entry. Pulp Paper Mag. Can. 52, no. 12: 125 (November, 1951).

A pulp cutter for sample cutting for moisture and basis-weight determinations is described which consists of a tinsmith's unishear and is mounted inverted in a table top with its cutting edge flush with the surface; it is claimed to eliminate the hazards of the conventional guillotine or knife and template methods. 1 diagram and 3 illustrations. E.S.

MACHINERY—DRIVE, ELECTRIC

EHEMANN, G. C., JR., BERGER, R. C., and MIKELSON, W. Automatic control of paper tension. Paper Ind. 33, no. 9: 1057-8 (December, 1951); *cf.* B.I.P.C. 21: 404.

The new General Electric multiple-generator, sectional drive with elec-

tronic amplidyne regulators is described with which the Ohio Boxboard Co. has equipped three of its board machines. A new type of sheet-tension control between the consecutive sections at the dry end of the machine has been installed. Starting with the seventh drier, each tensiometer provides the controlling signal for the section which follows it to adjust motor speed and to hold sheet tension constant with much greater precision and uniformity than is possible by manual operations. The construction and mode of operation of the instrument are discussed briefly; it can be applied to lightweight paper machines as well as to board machines. 3 illustrations. E.S.

MACHINERY—DRYERS

HUNT and MOSCROPT, LTD., *Middleton.* New dryer system for paper coating. World's Paper Trade Rev. 136, no. 22: 1582, 1584, 1586 (Nov. 29, 1951).

A brief description of a new two-pass drier system for off-machine coating is given for which accessibility, compactness, and high speed are claimed. It consists of a heated chamber with a multiple heat circulating system through which the paper passes without the coated side contacting any surface. An installation 54 feet in length will permit the drying of paper or board at 350 ft./min. with a brush coating unit applying a dry coating equal to 15 pounds double crown; much higher speed (600 ft./min.) may be attained when an air knife is substituted for brush coating, and the speed can be further increased when the weight of the coating is reduced. 3 illustrations. E.S.

PAPIERMACHER-BERUFSGENOSSENSCHAFT. Regular testing of drying cylinders. Wochbl. Papierfabr. 79, no. 19: 610 (Oct. 15, 1951). [In German]

The regular testing of drying cylinders, as prescribed for steam boilers and pressure vessels, is not yet compulsory in Germany, with the exception of Bavaria. In view of the prolonged use of most drying cylinders, coupled with continued forced operation, the association urgently recommends that all mills have their drying cylinders tested by competent engineers of their respective control boards at regular intervals of four years. Auxiliary equipment can be checked during operation (safety valves, steam traps, water removal systems, etc.), whereas the drying cylinders proper must be tested during a shutdown; not all cylinders must be tested at the same time. E.S.

MACHINERY—HEAD BOX

FASOLI, PAUL. The Sandy Hill flow control. Tappi 34, no. 12: 95-7A; discussion: 97A (December, 1951).

The construction of the unit as applied to the Fourdrinier machine is described. E.S.

JACKSON, P. A. Stock inlets. Tappi 34, no. 12: 92A, 94-5A (December, 1951).

The development from old-style headboxes with scissor slices to the high-head slices using nozzle discharges is discussed, with particular reference to the different variations in design incorporated by the Pusey and Jones Corp. E.S.

MACHINERY—PRINTING MACHINE

ANON. Press production tripled with no sacrifice in quality. Boxboard Containers 69, no. 708: 6-8 (December, 1951).

A report on the operation of sheet-fed rotary letterpresses which have been in operation only a short time is presented, with particular reference to their potentialities in the carton field. The machines are tripling press production with speeds up to 6000 sheets per hour at no sacrifice in quality. They require skilled operators and operate successfully only with smooth-edged and straight-edged board. Although they require a longer downtime, this is offset by the increased production they provide. This type of press is manufactured by Harris-Seybold Co. and Miehle Printing Press & Manufacturing Co. 11 illustrations. M.W.

MACHINERY—PUMPS

KARASSIK, IGOR J., and CARTER, ROY. Centrifugal pumps . . . Paper Ind. 32, no. 12: 1282-4 (March, 1951); 33, no. 1: 55-6; no. 2: 170-2, 183; no. 3: 297-8; no. 4: 411-12; no. 6: 669-71; no. 7: 784-7 (April-July, September, October, 1951); *cf.* B.I.P.C. 21: 324.

Continuing the series of articles on centrifugal pumps, the 1951 installments include the following subjects: Couplings and bedplates, p. 1282-4 (March, 1951); Vertical dry pit pumps, p. 55-6 (April, 1951); Vertical wet pit pumps, p. 170-2, 183 (May, 1951); Construction materials, Parts 1 and 2, p. 297-8, 411-12 (June, July, 1951); Factors involved in pump calculations, p. 669-71 (September, 1951); and How pump loads are determined and used, p. 784-7 (October, 1951). Numerous illustrations are included in the text; additional installments will be published in 1952. E.S.

MACHINERY—ROLLS

POST, JAMES E. A symposium on rubber covered rolls. Paper Mill News 74, no. 51: 10, 12, 14 (Dec. 22, 1951); Southern Pulp Paper Manuf. 14, no. 12: 72-4 (December, 1951).

The types of rubber coverings, including crude rubber, Buna S, Neoprene, and Hycar, the hardness of coverings, the factors involved in the determination of crowns on rubber rolls, the grinding of rubber rolls, and the care of rubber-covered rolls are discussed. M.W.

MACHINERY—ROPES

MCCORMICK, R. W. Carrier rope—experience with nylon. Paper Mill News 74, no. 52: 12 (Dec. 29, 1951); Pulp Paper Mag. Can. 52, no. 13: 114-15 (December, 1951); Southern Pulp Paper Manuf. 14, no. 12: 74-5 (December, 1951); Can. Pulp Paper Ind. 5, no. 1: 9-10 (January, 1952).

Two years' experience in the use of nylon carrier rope has shown that although it has great tensile strength, it is comparatively safe if a sufficiently small-diameter rope is used. Nylon rope can easily be spliced and run successfully, and although it is expensive, it has been found to last twice as long as cotton rope. M.W.

MACHINERY—SHAFTS

PETERMANN, J. E., and KING, W. F. Align shafts, not couplings. Paper Ind. 33, no. 9: 1050, 1069 (December, 1951).

Directions for the periodic checking of the correct alignment of shafts and for the correction of the different types of misalignment conditions are given. 8 diagrams. E.S.

MACHINERY—VALVES

MILLER, J. H. Remote control for paper machine stock gate; a

1950 gadget competition entry. Pulp Paper Mag. Can. 52, no. 12: 124 (November, 1951).

A mechanism for the remote control of the gate valve for adjusting the basis weight on the paper machine is described. 2 illustrations. E.S.

MATERIALS HANDLING

BAKER, EDGAR D. S. Mechanisation of packing lines. Brit. Packer 13, no. 11: 28-31 (November, 1951).

A discussion is presented of the considerations which are involved in the effective mechanization of packing lines, such as a study of the product, type of production (flowline or batch), package design, equipment design, maintenance, and control of size and quality of material. 1 illustration. M.W.

THE BRITISH PACKER. Handling of palletised goods for road and rail transport. (No. 2). Brit. Packer 13, no. 11: 26-7 (November, 1951); *cf.* B.I.P.C. 21: 708.

The demonstration of a lightweight electric fork-lift truck, Model E2/20, which was not available at an earlier demonstration of mechanical handling equipment, is described. 8 figures. M.W.

CANADIAN PULP AND PAPER ASSOCIATION. *Technical Section. Materials Handling Committee.* Unloading railway cars of pulpwood. Pulp Paper Mag. Can. 52, no. 12: 111 (November, 1951).

A system for unloading boxcars with either rough or peeled pulpwood from two sides of a conveyor and an incentive system of payment for the car unloaders are outlined. E.S.

MILL CONTROL

CURTIS, J. R. Meeting the challenge of maintenance and lost time in the paper mill. Paper Trade J. 133, no. 25: 16, 18, 21-2, 24 (Dec. 21, 1951); Southern Pulp Paper Manuf. 15, no. 1: 74-6, 78-81 (January, 1952).

The importance of preparedness in utilizing downtime is stressed, and the establishment of a special control center is recommended to schedule and plan job sequences to avoid conflicts between the different departments involved in maintenance. An example of this type of program is presented with illustrations of the various kinds of schedules which are employed. 7 figures. M.W.

HOWE, WILFRED H. Application of dielectric measurement to continuous processes. Instruments 24, no. 12: 1434-8, 1484, 1486; discussion: 1486, 1488, 1490 (December, 1951).

A discussion is presented of the principles and applications of capacitance-measurement techniques including primary elements and electric circuits for capacity measurement of solids, liquids, and gases; one of the oldest industrial applications to continuous process operation is the dielectric weighing of a continuous web or sheet material. 11 figures. M.W.

LA LIBERTE, LESTER H. Quality control in chemical formulation. Pulp & Paper 25, no. 13: 74, 76 (December, 1951).

The establishment and activities of a Chemical Formulation Section in the paper-machine-room area of the Parchment mill of the Kalamazoo Vegetable

Parchment Co. are described. The principal function of the Section involves the control of the formulations and flow of surface size, glue, wet-strength agents, and similar materials, as specified on each order. A considerable amount of the mill's tonnage is consumed by the food industry where strict quality control is essential. 6 figures. E.S.

NETHERCUT, P. E. Technical control of machine production. Tappi 34, no. 12: 107-10A; discussion: 110A (December, 1951).

Following a brief description of the Chester plant of the Scott Paper Co. (where all pulp is received by barge or rail), the process-control operations for tissue manufacture are outlined, as they apply to this particular type of operation. E.S.

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. *Kalamazoo Valley Section.* Quality control. Tappi 34, no. 12: 100-4A (December, 1951).

Six members of the panel each presented an unconventional or nonstandard test used in their plant for quality control as follows: Hall, Ray. Starch control, p. 100A; Galbraith, Martin. Procedure for operation of Sutherland ink rub tester, p. 101-2A; Harrison, J. J. Method of evaluating wax coverage on cold water waxed cartons, p. 102A; Kane, M. W. Rapid method for estimating the dry brightness of pulp slurry, p. 102A; Wilkins, Merle. Wet-rub resistance of paper coatings, p. 102-3A; and Kite, W. L. Iron tests (for water, pulp, and paper), p. 103-4A. E.S.

NEWSPRINT

CRAWFORD, H. D. Alaska can ease our newsprint shortage. Am. Forests 57, no. 11: 6-9, 46, 48 (November, 1951).

One possible way to alleviate the current newsprint shortage involves the construction of newsprint mills in Alaska where the assurance of unlimited timber supplies, abundant hydroelectric power, a relatively mild climate with heavy rains which minimize the danger of forest fires, and cheap raw material all lend feasability to such a project. In spite of the heavy initial investment which is required for a newsprint mill and a relatively high cost of construction, indications are that a co-operative venture by a group of publishers would prove to be economically sound. 6 illustrations and 1 map. M.W.

SIGAL, MARLOW A. Waterproofing of newsprint. ANPA Mechanical Research Laboratories Progress Report no. 1. Am. Newspaper Publ. Assoc., Tech. Report no. 4: 12 p. (Nov. 23, 1951).

Tests to determine the usefulness of Dri-Film (trade-mark of General Electric Co., a mixture of methyltrichlorosilane and dimethyldichlorosilane) as a waterproofing agent for newsprint show that if the paper is subjected to the practical concentration of 3% by volume and exposure time of one second, a very significant water resistance can be imparted. The measures of waterproofness presented in several tables do not seem to bear any direct relation to the exposure times. This tends to indicate that, with a 3% concentration of Dri-Film, the reaction of silane with surface moisture goes to practical completion in one second or less. Mention is made of the objectionable physical and chemical properties of Dri-Film and the resulting difficulties of applying it effectively in a production operation. 3 tables, 6 figures, and 1 reference. E.S.

TIPKA, VERNON L. Newsprint paper: North American trends in first half of this year. World's Paper Trade Rev. 136, no. 8: 564, 566, 572 (Aug. 23, 1951); *cf.* B.I.P.C. 22: 28.

During the first half of 1951 newsprint production in North America amounted to 3,299,000 tons, a 7% increase over the previous comparable peak total in 1950. Shipments of newsprint from North America also increased 7% more than the same period in 1950. Canadian newsprint exports amounted to 90% of the total Canadian production, and 95% of the exports were sent to the United States. Imports of newsprint in the United States during the first five months of 1951 exceeded those of 1950 by 95,000 tons. Newsprint stocks were up 8% over 1950. Consumption in the United States for the first half of 1951 fluctuated within narrow limits, and the cumulative usage for this period was 0.5% greater than in 1950. 2 tables. M.W.

NITROGEN PACKAGING

WALKER, W. S. Principles of nitrogen packing in flexible film. Food Technol. 5, no. 12: 499-502 (December, 1951); *cf.* B.I.P.C. 20: 264.

The shelf life of dry food products, particularly those containing edible oils, packaged in flexible films can be extended appreciably by the displacement of the package free-space oxygen by nitrogen and the continued exclusion of atmospheric oxygen from the package during storage. The choice of a suitable packaging film of low oxygen permeability and the methods for checking the effectiveness of oxygen exclusion are discussed. Thus far only one material (polyvinylidene chloride) has been found situable to be used as a single transparent film for nitrogen packaging; however, several laminated and coated film materials of the transparent and opaque type exist which give excellent performance in this regard. Nitrogen-packed products are compared with air- and vacuum-packed products in terms of quality and shelf-life stability. 1 table, 5 figures, and 3 references. E.S.

PACKAGING

CONTINENTAL CAN COMPANY. *Paper Container Division.* New idea in ice cream packaging. Packaging Parade 19, no. 227: 67 (December, 1951).

A new idea in ice cream packaging, the Cut-A-Pack half-gallon, cylindrical container is scored for cutting into three equal sections, each holding one and one-third pints. The user cuts off the top third of the package and replaces the cover on the reduced container which is then more convenient for storage in the freezer compartment of any refrigerator. 4 illustrations. M.W.

LAMBLE, KENNETH. Is packaging design worth the candle? Paper Box Bag Maker: 195-7 (November, 1951).

The author emphasizes the importance of good packaging design which is developed by an experienced designer for the effective merchandising of products. 1 illustration. M.W.

MODERN INDUSTRY. Packaging; how to save money and materials. Modern Industry 22, no. 6: 38-46 (Dec. 15, 1951).

The National Production Authority has predicted a short supply of packaging materials for the months ahead, and substitute packaging materials will have to be devised. Some specific suggestions for redesigning packages and

simplifying packaging operations are presented in a series of illustrations and charts, and examples of savings and sources of help on packaging problems are contained in the text. 26 illustrations. M.W.

WHARTON, THOMAS P. Korea: proving ground. Modern Packaging 25, no. 4: 81-7 (December, 1951).

Current military export packaging practices have been justified by information gathered in reports and surveys from military installations throughout the world. To obtain a more detailed and firsthand report, a team of technical service representatives was sent to Korea to examine the unloading, handling, and storage conditions which the packages encounter and to report on the effectiveness of the packaging methods in use. The report of the team concluded that where specifications and instructions are observed, losses and damage are slight. Rough handling as a result of untrained labor is a serious problem, and for this reason, commercial shipping containers are not adequate. In boxing and crating large items, some damage was noted to be a direct result of faulty interior blocking and bracing. A tendency to pack too much in a container and improper marking were other reasons for damage. The new Military Standard 129 which provides uniform marking requirements for all branches of the service will eliminate confusion in this respect. 10 illustrations. M.W.

PAPER—ABSORBENCY

L. E. Absorptivity of printing and blotting paper. Allg. Papier-Rundschau no. 21: 907-8 (Nov. 12, 1951). [In German]

The author discusses the different absorptivity requirements of printing and absorptive papers (blotting paper; base papers for parchmentizing, vulcanized fiber, and impregnation; and reagent and medicated papers), factors which exert an influence during manufacture, selection of suitable raw materials, and testing procedures. E.S.

PAPER—CURLING

ANON. Printers' paper problems. XVII (incorrectly given as IV). Curling: 1st cause and remedy. Indian Print and Paper 16, no. 68: 34 (July, 1951); *cf.* B.I.P.C. 22: 33.

The physical reasons of paper curling, the advantages of matured paper, and remedies for the trouble are discussed briefly. E.S.

PAPER—DEFECTS

AIKEN, E. Overcoming difficulties in the printing of machine finished papers. Pulp Paper Mag. Can. 52, no. 12: 100-1 (November, 1951).

The author very briefly discusses the results of some paper defects on the printed sheet, including edgebound and short-grain paper, curl, distorted and irregular-size sheets, picking, irregular finish, poor mat formation, transparency, irregular affinity for ink, absorbency, dust, fluff, poor folding qualities, offset, and static. E.S.

GEESE, CHARLES F. Paper picking and offset papers. Natl. Lithographer 58, no. 12: 40 (December, 1951).

The various causes for paper surface picking in the offset process are described, including improperly sized paper, inaccurate rollers, and excess moisture in the ink. Some corrective measures are suggested. M.W.

[KOTTE, HANS] The destruction of the ink resistance of a writing paper. Allg. Papier-Rundschau no. 21: 906 (Nov. 12, 1951). [In German]

A ruled copy book whose paper exhibited a satisfactory ink resistance showed running of the ink lines drawn with a steel pen wherever they crossed the ruling. An investigation brought to light that the ruling ink had been diluted with wood alcohol in place of the customary denatured alcohol, the supply of which was temporarily exhausted. Certain components of the wood alcohol destroyed the sizing of the paper wherever the ruling was applied. The trouble disappeared completely as soon as denatured alcohol was again used with the ruling ink. E.S.

PAPER—MERCHANDISING

AMERICAN PAPER MERCHANT. Bouer Paper Company. Am. Paper Merchant 48, no. 10: 12-13, 55; no. 12: 10-11, 47-9 (October, December, 1951).

The management and sales policies of the Bouer Paper Company, Milwaukee, a fine paper house, are described. Some of the factors which have contributed to its success in the paper merchandising field since 1906 include a special educational program for salesmen, emphasis on the role played by truck drivers in the success of the company, and a close personal, as well as business, relationship with the mills who supply the paper. The company represents more than 50 mills and handles approximately 400 lines. Its business is divided roughly into 35-40% warehouse sales and the remainder mill shipments. 3 illustrations. M.W.

NATIONAL PAPER TRADE ASSOCIATION. An analysis of sales by paper merchants during the past eleven years. Am. Paper Merchant 48, no. 12: 15, 40-1 (December, 1951).

Statistics concerning sales and operating expenses for merchants of both fine and wrapping papers are presented for the years 1940-1950, inclusive. The average final net profit for the 11-year period, after taxes, was $0.33/100 lb. for fine paper and $0.28/100 lb. for wrapping paper. With regard to earnings for 1950 there are certain apparent discrepancies in the data presented. 2 tables. M.W.

PAPER & TWINE JOURNAL. Dillard Paper Company. Paper & Twine J. 25, no. 10: 6-7, 28 (December, 1951).

The organization and policies of the Dillard Paper Company, Greensboro, N.C., paper merchants, are described. 3 illustrations. M.W.

PAPER—SHEET FORMATION

BENNETT, W. E. Some Fourdrinier wet end experiments. World's Paper Trade Rev. 136, no. 23: 1641-4, 1649-52 (Dec. 6, 1951).

Quantitative information on the effect on drainage of the arrangement and operation of the paper machine and of the physical and chemical properties of the stock is meager; attention is drawn to the desirability of being able to predict drainage on the Fourdrinier wire from the knowledge of certain machine and stock conditions by studying the problem as a whole. Two experiments are reviewed: (*a*) the experiments and data by Cowan and Scott (*cf.* B.I.P.C. 7: 229-30) and (*b*) an experiment by the British Paper

and Board Research Association on a newsprint machine of the Grimsby mill of Peter Dixon & Son, Ltd., in which drainage at the various points of the wet end was measured and related to the stock and machine conditions. The experiments are described in detail; the analysis of the data requires the separation of the various factors. Appropriate statistical techniques exist for this purpose, and the general lines of work at the Association are given. No conclusions are drawn from the data obtained, because the present theories of drainage do not properly account for all the variables involved, and a new theory has been developed which requires another experiment under controlled conditions of speed and temperature. The complete analysis of the experiment will be published as a report of the Research Association. It is considered that a statistical study of the operation of the paper machine should precede academic work on the mechanism of filtration or the piecemeal development of pulp evaluation tests. 2 tables, 3 figures, and 3 references. E.S.

PAPER AND PULP INDUSTRY

ANON. The American paper stationery market. Paper Market: 115-18 (November, 1951).

An analysis of the stationery market in the United States is presented, and it is suggested that the specialty items provide the principal opportunity for British manufacturers. A list of the prevailing duties on stationery items in the U. S. Customs Tariff is included. M.W.

BERTIN-ROULLEAU, J. The increase in French pulp capacity from now to the end of 1952 should amount to 171,000 tons. Rev. papiers et cartons 14, no. 18: 543, 545-6 (Oct. 15, 1951). [In French]

In 1946, the Monnet plan for the reconstruction and extension of the French industry set a capacity of 815,000 tons of pulp from domestic raw materials by the end of 1952 as a goal, including mechanical and chemical wood pulps and bleached straw pulps. Data are given to show that according to present revamping and enlargement programs, a capacity of 790,000 tons should be reached by the beginning of 1953, which does not fall very short of the amount of the original plan. 6 tables. E.S.

SCHEYE, KLAUS G. Decline in business activity—1948-1949 in the United States pulp and paper industry. Paper Trade J. 133, no. 23: 24, 26; no. 24: 20, 22, 24, 28, 30, 32 (Dec. 7, 14, 1951).

To gain an understanding of the behavior of the major corporations in the pulp and paper industry during a cyclical downturn such as occurred in 1949, data on net sales and profits are presented and analyzed. Almost all companies were affected by the decline. The ability to decrease inventories rapidly greatly influenced the profit picture. When competition becomes keen, most companies expand sales efforts, and some apparently finance their customers to a considerable extent. The large companies were better able to withstand a bad year because their cash position was better, they exercised superior control over inventories, and were able to push sales while continuing to improve their plant and equipment. The large companies profited from a more diversified product line which is the result of superior market research facilities and other managerial techniques. 18 tables and 3 diagrams. M.W.

UNION DES IMPORTATEURS DE PÂTES À PAPIER. The myth of a world price. Papeterie 73, no. 10: 542, 545, 547, 549, 551, 553, 555, 557, 559, 561 (October, 1951); Rev. papiers et cartons 14, no. 20: 615-17, 619-20 (Nov. 15, 1951). [In French]

Evidence is presented, supplemented by statistical data, to show that a world price for pulp no longer exists, because it varies with the exporting and importing country. 14 tables in the first, and 3 tables in the second reference. E.S.

PAPER AND PULP INDUSTRY—EDUCATION

ANON. The first foremen's course of the paper industry at the Oskar-v.-Miller Polytechnikum, Munich. Allg. Papier-Rundschau no. 21: 902 (Nov. 12, 1951); Wochbl. Papierfabr. 79, no. 21: 678-9 (Nov. 15, 1951); Das Papier 5, no. 21/22: 448-9 (November, 1951). [In German]

Reference is made to a two-month foremen's course held in August and September, 1951, including technical, social, human-relations, management, and safety subjects, mill visits, and discussions. The interest of all participants, most of whom belonged to the young generation, was very satisfactory and showed the widespread desire for additional education; however, a certain lack of fundamental knowledge became evident. To make future courses of this type of greatest benefit to all, the mills sending members should see that this fundamental knowledge is acquired during the work. E.S.

CITY AND GUILDS OF LONDON INSTITUTE. Papermaking examinations. World's Paper Trade Rev. 136, no. 22: 1565-8, 1573-5 (Nov. 29, 1951).

The questions given in the intermediate and final examinations are listed, and an assessment is made of the manner in which the students answered these questions. 3 tables. E.S.

PAPER AND PULP MILLS

ANON. The paper problem in France. Papetier 5, no. 10: 27-8, 31, 33 (October, 1951). [In French]

Following a brief historical introduction and outline of the processes involved in paper manufacture, statistical data on the number of French pulp, paper, and board mills and their distribution and capacities (by provinces or départments) are given. 1 table. E.S.

FOX, HOWARD. The Union Bag and Paper Corporation story. Paper Box Bag Maker: 191-2 (November, 1951); *cf.* B.I.P.C. 21: 862.

The history of the development of the company, its present production, and the scope of its research program are discussed briefly. 1 illustration. M.W.

HUDSON PULP & PAPER CORPORATION. Hudson opens Palatka mill addition. Paper Trade J. 133, no. 24: 12 (Dec. 14, 1951); Paper Mill News 74, no. 50: 12 (Dec. 15, 1951); *cf.* B.I.P.C. 22: 121.

The dedication and opening of Hudson's new plant at the Palatka, Fla. kraft mill are announced. 1 illustration. M.W.

MINNESOTA AND ONTARIO PAPER COMPANY. M & O modernization continues. Paper Trade J. 133, no. 23: 28-30 (Dec. 7, 1951);

Can. Pulp Paper Ind. 4, no. 12: 10-13 (December, 1951); Pulp Paper Mag. Can. 52, no. 12: 80-4 (November, 1951); *cf.* B.I.P.C. 22: 124.

The most recent improvements and installations which comprise part of the company's modernization program are described. 4 illustrations in each of the two first references, and 8 in the last one. M.W.

PORTER, RICHARD W. Chesapeake expands to 500 tons. Paper Ind. 33, no. 9: 1062-9 (December, 1951).

As a result of a postwar modernization and expansion program, the plant of the Chesapeake Corp. at West Point, Va. has increased its daily output to about 500 tons of unbleached sulfate pulp, of which about 150 tons are market pulp and 350 tons are made into paperboard, the mill's primary product, and other kraft papers. The major installations of the past few years are described, including the wood-handling system, pressure washing of kraft pulp, flash drying of lime-kiln feed, high-density storage tanks, a Ross convection-type pulp drier, and the suspension burning of bark and wood waste. 23 figures. E.S.

PULP & PAPER. The new Biron mill, an efficiently engineered plant. Pulp & Paper 25, no. 13: 44, 46 (December, 1951).

A brief description of the recent modernization program of the Biron mill of the Consolidated Water Power & Paper Co. in Wisconsin is given, with particular reference to the new 138-inch trim Rice Barton Fourdrinier machine for the production of enameled book paper. A Solozone bleach plant is employed for upgrading the groundwood used in quality papers. 2 illustrations. E.S.

PAPER AS A TEXTILE MATERIAL

THIEME, G. The spinning of paper yarn. Melliand Textilber. 32, no. 8: 586-7 (August, 1951). [In German] *cf.* B.I.P.C. 10: 246.

The processes involved in the spinning of paper yarn are outlined, including the requirements of a suitable paper, the cutting of the paper rolls, impregnating agents, the spinning (or more correctly, the twisting) of the paper ribbons and the machinery employed for this purpose, the relationship of twist to yarn strength and number, the respooling and storage of the yarns, and applications. 1 table. E.S.

PAPER FINISH

ANON. The A B C of paper and boards. Papetier 5, no. 10: 51, 53, 55 (October, 1951). [In French] *cf.* B.I.P.C. 22: 349.

Different types of common paper finishes and their applications are described briefly. E.S.

PAPER MACHINE OPERATION

ARLOV, A. P., and IVARSSON, B. Effects of draws and felt tension on mechanical properties of paper. Svensk Papperstidn. 54, no. 21: 729-38 (Nov. 15, 1951); Pulp Paper Mag. Can. 53, no. 1: 84-91, 94 (January, 1952). [In English; German and Swedish summaries in first reference]

The effects of certain operating conditions in the drier section of a paper machine on the stress-strain properties of paper were studied, with particular attention to the influence of the draws and felt tension. The experiments were

performed with unbleached sulfite pulp beaten to 40° S.-R. and under constant operating conditions at the wet end of the paper machine. The variations in the properties of the sheet traveling through the drier section were followed by taking samples from different stages of drying and allowing them to dry freely in air and without subjecting them to tension. The samples were then tested in an automatic stress-strain recorder, and the results are expressed as deformation until an elongation of 2% is reached to characterize the mechanical properties of the paper. The shrinkage of the web during its passage through the drier was followed by marking the web with stained cog wheels. The study has shown that changes in the stress-strain properties of the sheet depend on dimensional changes of the web. If shrinkage is prevented by using tight draws and felts, a mechanical hardening of the paper takes place in the direction of the tension, which results in a decreased extensibility of the finished paper. Fiber bonding in the web must be sufficiently developed before the sheet exhibits mechanical hardening and, as a rule, the greatest decrease in extensibility takes place after the web reaches a dryness of 75%. The correlation between moisture content, shrinkage, and stress-strain properties under different drying conditions is discussed and illustrated in a diagram. 1 table, 13 figures, and 29 references. E.S.

WADDELL, C. S. A study of optimum system temperatures for newsprint machines. Pulp Paper Mag. Can. 52, no. 12: 90-5 (November, 1951).

It is generally accepted that there exists one temperature or temperature range for paper-machine operating conditions which will give each mill the highest efficiencies and the lowest operating costs. The purpose of the present paper is to offer a guide to establish this optimum working temperature range by studying the balance between beneficial and detrimental conditions produced by a temperature rise, so that each mill should be able to apply the results to its own particular problem. The beneficial effects of a temperature rise include a lower viscosity of water and better removal from the sheet, fiber savings (if the rise is brought about by closing the white water system), reduced fresh-water usage, and reduced stream pollution, whereas improved slime-growth conditions, an accelerated rate of corrosion, increased pitch troubles, and a larger retention of mill dirt must also be taken into consideration. For paper machines with normal wood and fuel costs and with adequate drying capacity at the lower stock temperatures, the most advantageous operating temperature is just below the point where slime begins to reduce efficiencies to any extent. This applies particularly to slow-speed machines. At the present time very few machines can raise their temperatures beyond 105°F. without using direct steam; hence, the benefits of drier steam savings are definitely limited, whereas the cost of slime treatment in this range is usually high which, in addition to heavier corrosion, shorter wire and equipment life, and reduced machine efficiencies makes the over-all benefits appear rather doubtful. The high-speed machines present an entirely different situation, as higher temperatures are required for better water removal to avoid overloads on the driers. In most of these cases the headbox temperatures are within the slime-forming range, and the expense of treatment is unavoidable. It would seem profitable to investigate the possibilities of pushing the temperatures into the higher ranges (in excess of 115°) where the growth of slime is prevented and of using fresh-water dilution warmed by means of a heat exchanger. Conventional heat exchangers are out of the question, because they would require excessively large installations; however, the application of the heat pump to this problem may hold the solution. 1 table, 3 diagrams, and 12 references. E.S.

PAPER SPECIALTIES

AMERICAN CYANAMID COMPANY. Wax treated papers and

boards. Paper Mill News 74, no. 49: 81-2, 84 (Dec. 8, 1951).

An alphabetical list of types of paper and paperboards which have been treated with wax size or wax emulsions is presented. The point of application and the resulting new characteristics which were obtained by the applications are given. M.W.

ANON. Adhesive tapes. Papetier 5, no. 9: 68-70 (September, 1951). [In French]

Different types of "Scotch" tapes (which adhere to a variety of surfaces without moistening) and various devices for applying them to paper and board are described. 7 illustrations. E.S.

BRADBURY, R. Waxed papers and their production. World's Paper Trade Rev. 136, no. 21: 1492 (Nov. 22, 1951).

A brief reference is made to developments in British machinery for producing waxed and wax-laminated papers. Printing at the same time as waxing and laminating has been found to slow down the speed at which waxing can be done, so that it is still more practical and economical to make the printing a separate operation and rewind the material before passing it to the waxing machine. E.S.

DAY, FREDERICK T. Paper conversion and usage. No. 20. Paper for stationery: additional treatment. World's Paper Trade Rev. 136, no. 19: 1316, 1318, 1320 (Nov. 8, 1951); *cf.* B.I.P.C. 22: 267.

Reference is made to the considerable volume of paper converted into commercial stationery, and a brief survey of paper treatments for the printer and stationer is presented to show the possibilities for remedying paper and printing faults. Sizing and varnishing, plate rolling, and finishing before or after printing are discussed. 2 illustrations. E.S.

DAY, FREDERICK T. Paper conversion and usage. No. 21 (Parts 1 and 2). Special adhesive and other label papers. World's Paper Trade Rev. 136, no. 21: 1490-1; no. 23: 1612, 1614, 1616 (Nov. 22, Dec. 6, 1951).

Powerful-adhesive label papers for special purposes and pressure-sensitive adhesive papers, including their body stocks, adhesives, and applications, are described. 3 illustrations. E.S.

E. I. DU PONT DE NEMOURS & Co. Get it on paper . . . Du Pont Mag. 45, no. 6: 8-9 (December, 1951-January, 1952); *cf.* B.I.P.C. 22: 18.

Mention is made of types and properties of neoprene-treated papers, including a filter paper that appears to be an adequate substitute for canvas duck filter cloths. This product is currently being used at the Du Pont Chambers Works at Deepwater, N.J. 4 illustrations. M.W.

LATHAM, CHARLES W. Here is the importance of paper in offset lithography. Am. Printer 132, no. 11: 37, 56, 58, 60, 62 (November, 1951).

The author discusses the various properties and characteristics of paper which affect its printability in lithography and suggests some precautions to observe in handling and printing to insure the best results. 1 table and 1 figure. M.W.

MORRIS, CHARLES V. 'Hate-to-lose-an order' view can bring profitable results. Paper & Paper Products 93, no. 6: 16, 18-19 (Dec. 5, 1951); *cf.* B.I.P.C. 22: 125.

Additional examples of the successful substitution for unobtainable stocks by alert paper salesmen are given. 2 tables. E.S.

ORGANISATION FOR EUROPEAN ECONOMIC CO-OPERATION. Paper milk containers in America. Paper Box Bag Maker: 193-4 (November, 1951); *cf.* B.I.P.C. 22: 308-9.

A section of the completed O.E.E.C. report is presented in which the advantages of paper milk containers are summarized, and a description of their manufacture at the New Jersey plant of The American Can Co. is given. At the present time 50% of the milk consumed in the U. S. is delivered in paper containers. M.W.

PARCHMENT, ANIMAL

KLINE, GORDON M. Preservation of the Declaration of Independence and the Constitution of the United States. Tech. News Bull. Natl. Bur. Standards 35, no. 9: 116-20 (August, 1951); ASTM Bull. no. 178: 32-3 (December, 1951).

Procedures for the permanent preservation of the original parchment documents of the Declaration of Independence and the Constitution are described. The documents will be sealed in airtight envelopes of glass which is bonded to a metal frame. Each document-leaf will have its own enclosure and will rest on a special pure cellulose backing paper in an inert atmosphere of 99.99% pure helium at a controlled humidity. The enclosures will be exhibited in the shrine at the Library of Congress behind special filters that will shield the parchments from destructive light rays. 6 illustrations. M.W.

PHYSICAL TESTING—FASTNESS TO LIGHT

DAVIES, O. L., and MARNEY, E. Fixed standards for staining assessment in fastness testing. J. Soc. Dyers Colourists 67, no. 11: 438-40 (November, 1951).

A series of 24 patterns, representing typical stains likely to be encountered in fastness testing, were evaluated by 103 observers, making 3192 assessments in all; each evaluation was made with both the I.C.I. standards (nine hues) and the Munsell gray standards. A statistical analysis of the results showed that the difference in reliability of the two scales was not of sufficient magnitude to be of practical importance. Although the two scales were developed independently, the differences between them are surprisingly small, and for all practical purposes the scales may be regarded as identical. 8 tables and 2 references. E.S.

GODLOVE, I. H. Improved color-difference formula, with applications to the perceptibility and acceptability of fadings. J. Optical Soc. Am. 41, no. 11: 760-72 (November, 1951); *cf.* B.I.P.C. 22: 192-3.

The derivation of the color index formula referred to in the previous reference is presented, and its validity and applicability are discussed. 8 tables, 7 figures, and 14 references. M.W.

LUSZCZAK, A., and ZUKRIEGEL, H. Fastness to light and ultra-

violet absorption of dyestuffs. Melliand Textilber. 32, no. 11: 868-70 (November, 1951). [In German]

In a preliminary communication the authors report a certain regularity observed in the extinction of aqueous dyestuff solutions when exposed to ultraviolet rays, according to which they determined a correlation between the position of a characteristic extinction band and the evaluation of the fastness-to-light properties. This correlation can be expressed by a mathematical equation. 1 table, 4 diagrams, and 37 references. E.S.

SCHAEFFER, ALBERT. Photochemical and thermal influences on fibers and dyestuffs. Melliand Textilber. 32, no. 8: 617-20 (August, 1951). [In German]

Evidence is presented to show that changes in dyed fibers which are exposed to light may result not only from photochemical degradation but also from thermal influences. The latter may even assume greater importance than the former, depending upon the conditions employed during the exposure and the type of box used for holding the specimens during the tests. To reduce the thermal influences to a minimum, the author recommends the replacement of the usual boxes with large, well-ventilated testing chambers. 7 tables. E.S.

PHYSICAL TESTING—INK

ANDERSSON, ALF. Testing the rheological properties of news inks. Grafiska Forskningslaboratoriet Medd. no. 26: 3-15 (May, 1951). [In Swedish; English summary]

A number of commercial and laboratory-prepared news inks were tested in the Precision-Interchemical rotational viscometer to obtain information on the variations of the rheological properties of new inks for different types of presses. A registering device was attached to the viscometer, and the mathematical treatment of the diagrams obtained is described. 4 tables, 9 figures, and 2 references. E.S.

PHYSICAL TESTING—PAPER

ANON. The A B C of paper and boards. Papetier 5, no. 9: 43, 45, 47 (September, 1951). [In French] *cf.* B.I.P.C. 22: 37.

The significance of resistance to tear, tensile strength, breaking length, paper grain, curling, resistance to perforation, and look-through are discussed, and simple methods for their determination are described. E.S.

PHYSICAL TESTING—PAPER—BONDING OF FIBERS

WILSON, W. S. The mechanism of fiber bonding. Tappi 34, no. 12: 561-6 (December, 1951); *cf.* B.I.P.C. 19: 498.

According to the author's theory no interfiber chemical bonds are involved in fiber bonding, but the strength of the paper bond is a purely mechanical phenomenon. A study of the mechanism of the wet-break test and the effects of sizing, wet-strength resins, and wet strength from dry heating on this test was made. The increased stiffness and constant relative increase in the wet-break test with heating on two freenesses of pulp are used as evidence of the belief that the strength of paper is purely mechanical. Very rough stress-strain data are introduced to strengthen this assumption. Some density *vs.* dry-strength curves (where density is varied by both beating and increased surface tension) are presented. These curves on four different pulps meet the expectations of the mechanical theory and may indicate two unconsidered

variables in pulp. The author postulates that the flabbier a pulp becomes on beating, the more marked will be the degree of crimping under a given pressure during sheet formation and the denser the sheet which will result. This increased density produces greater tensile strength. The stiffer the pulp becomes on drying, the harder it is to uncrimp under stress and the stronger the sheet. 10 figures. E.S.

PHYSICAL TESTING—PAPER—PRINTABILITY

CARLSSON, GÖSTA E. Experimental printing of newsprint with inks of different composition. Grafiska Forskningslaboratoriet Medd. no. 26: 46-50 (May, 1951). [In Swedish; English summary]

Three samples of newsprint from different paper mills were printed in a proof press with eight inks of different composition, and the degree of blackness of the print and the strike-through were measured optically. No fundamental influence of the ink composition on the difference of the printing results between the three papers could be established; however, it was found that inks which contained 12% carbon black caused considerably less strike-through and a somewhat higher degree of blackness than inks with only 10% carbon black. 5 tables and 2 references. E.S.

PIHL, L. Some studies of ink transfer to paper in printing. Grafiska Forskningslaboratoriet Medd. no. 26: 16-45 (May, 1951). [In Swedish; English summary]

The different conditions which affect the ink transfer to paper during printing, especially letterpress printing, are discussed. An account is given of a series of experimental printing runs in a Vandercook proof press where printing pressure and speed could be accurately controlled. The ink transfer to the paper was measured by weighing the plate before and after printing. The ratio of the amount of ink on the paper to the amount of ink which remains on the plate is called the ink distribution number (I). If (I) is plotted against the amount of ink on the plate before printing, it exhibits a marked maximum which appears at widely separated ink amounts for different types of paper. The magnitude of (I) at this maximum differs greatly for different papers; it is, for example, about four times greater for coated art paper than for ordinary supercalendered paper. The strength of the adhesive forces between the paper surface and the ink is important for the ink transfer to papers with a high finish, whereas the ink transfer to papers with a low finish is affected to a higher degree by the porosity of the paper. The effects of different conditions of printing pressure, printing speed, and ink viscosity on the ink transfer to papers of different types were investigated. The studies are being continued. 2 tables, 12 figures, and 13 references. E.S.

PHYSICAL TESTING—PAPER—THICKNESS

HART, JOHN A., and WELLS, DAVID J. Magnetic caliper gauges for papers. Pulp Paper Mag. Can. 52, no. 12: 102-4, 118 (November, 1951).

Magnetic gages possess several useful advantages as compared with the mechanical gages commonly used; they are sensitive, convenient to use, robust, and versatile in application. Two instruments have been designed especially for use with papers, and details of their construction are described. A method for greatly increasing the sensitivity of extension measurements with the Schopper tensile tester by means of one of these instruments is outlined. Measurements which were impracticable with mechanical gages have been

successfully carried out with the magnetic instruments. 5 figures and 4 references. E.S

PHYSICAL TESTING—PAPER BAGS

TESCHNER. The testing of paper bags; report of the testing station of the Natronzellstoff- und Papierfabriken AG., Oker/Harz. Allg. Papier-Rundschau no. 21: 898-901 (Nov. 12, 1951). [In German]

Following a brief discussion of the poor correlation of standard static paper-strength tests and the actual performance of paper bags, the methods and testers used for routine control by the above-mentioned mill are described; they include a table drop tester, a revolving drum, a shoulder throw-off tester (I), and a special bursting-strength tester (II). Wherever possible, the conditioned bags are tested with the contents which they are intended to carry; for certain fundamental studies, a mixture of sawdust and quartz sand is employed. Attention is paid to the fact that the degree of filling corresponds to that actually used in practice. (I) consists of a first horizontal, then ascending conveyor belt which carries the filled bag to a tripping board from where it drops from a height of 1.10 m. to the ground; the bags are placed on the conveyor with the seams and valves in different positions in a definite sequence. The height of the test results obtained with the first three instruments varies considerably; as a rule, the highest values are obtained with the drum tester, and the lowest with (I). In a series of experiments with pasted valve bags and sand filling, the ratio of the results of (I)—drop table—revolving drum was: 1:3:7. (II) is used for testing unfilled open block-bottom bags. The bag is drawn over a rubber bladder which, in turn, is pulled over a metal canister; water is pumped between the canister and bladder until the expansion of the latter causes the bag to burst. This static bursting-strength test gives an indication of satisfactory bag conversion; with uniform pasting of all seams of multiwall bags, all layers will burst simultaneously, otherwise one after the other. Testing chambers for extreme (arctic and tropical) conditions and an instrument for simulating the impact of loaded railway cars are under construction. 8 figures and 4 footnotes. E.S.

PHYSICAL TESTING—PULP—COOKING DEGREE

PATTERSON, R. F., KEAYS, J. L., HART, J. S., STRAPP, R. K., and LUNER, P. The spectrophotometric determination of lignin in sulphite cooking liquor. Pulp Paper Mag. Can. 52, no. 12: 105-11 (November, 1951).

The extent to which ultraviolet light of 280 mμ wavelength is absorbed by dilute solutions of sulfite digester liquor is shown to be a rapid and accurate method of determining the concentration of lignin present. Other substances contained in the digester liquor do not introduce more than 1% error in the determination. Data obtained from both commercial and miniature digesters are presented. It is suggested that the method offers some improvement over liquor color determinations as a means of commercial cooking control and that it furnishes a valuable tool for fundamental studies of lignin sulfonation in experimental digester investigations. 1 table, 8 figures, and 29 references. E.S.

PHYSICAL TESTING—PULP—SWELLING

KRÜGER, K. The determination of the swelling properties of pulp. Reyon, Synthetica, Zellwolle 29, no. 10: 405-7 (October, 1951). [In German]

The testing method FaChemFa Zst3 of the Fachgruppe Chemische

Herstellung von Fasern prescribes the punching of pulp rings with an outside diameter of 30 mm. and an inside diameter of 8 mm. from an airdry pulp sheet. The author criticizes the disadvantages of the punch specified for this purpose and describes the construction and operation of an improved device which he has developed. Attention is drawn to the need for careful checking of the thickness of the pulp sheet, preferably by means of a cathetometer, and to the use of a greater number of tests than five (as prescribed) for very accurate measurements. 4 diagrams. E.S.

PHYSICAL TESTING—WAX

PADGETT, JOHN W. Hardness, blocking, and cooling curve modulus of paraffin wax. Tappi 34, no. 12: 547-52 (December, 1951).

A modified and improved consistometer for determining the hardness of paraffin wax is described, and the relationship between blocking and hardness illustrated. A new test, the cooling-curve modulus, is described and its relation in a general way to hardness and blocking shown. 2 tables, 10 figures, and 6 references. E.S.

PHYSICAL TESTING—WAXED PAPER—SEALING STRENGTH

MUELLER, GEORGE P. Factors in waxed-paper sealing. Modern Packaging 25, no. 4: 125-9 (December, 1951); Am. Paper Converter 26, no. 1: 10-11, 44-7, 49 (January, 1952); *cf.* B.I.P.C. 22: 274.

Some of the conditions which might affect the seal strength of paraffin-waxed paper were examined, and the data show that, aside from the inherent properties of the wax and the base sheet, the external conditions which predominantly affect the seal strength of the wax are those which influence the cooling rate of the seal. Seal strength increases with increasing cooling rate, and may be due to speed, coolant temperature, or a combination of both. The temperature of the wax, the amount of pressure, and the dwell time are secondary factors in as much as they influence the cooling rate. This phenomenon is probably related to the various possible crystalline structures of paraffin wax. 18 figures. M.W.

PLASTIC FILMS—TESTING

SIMRIL, V. L., and FLIERL, D. W. Predicting film durability. Modern Packaging 25, no. 4: 130-4, 176, 178 (December, 1951); *cf.* B.I.P.C. 22: 275.

Laboratory tests for the measurement of impact and tear strengths and flex life were used to rate films and papers in the order of their relative resistance to failure when used in making packages. Failures of heavy packages are usually caused by impact forces which are received when the carton is dropped or otherwise roughly jolted. Lighter-weight packages are most likely to fail because of flexure of their walls as a result of vibration. It was found that the relative abilities of any group of materials to withstand both types of abuse will not necessarily correspond and therefore no single test can be employed to predict resistance to both impact and vibration damage. It is suggested that the greatest merit of this type of laboratory testing lies in comparing a specific material of unknown performance with some material whose capabilities are already known. 7 tables, 2 figures, and 10 references. M.W.

PLASTICS—PAPER-BASE

ANON. Laminates for railways. Brit. Plastics 24, no. 270: 368-71 (November, 1951).

Because of their durability, resistance to scratches, stains, and attack by termites or fungi, and their incombustibility, laminated panels are being used in many types of railway carriages. Some of the finishes and applications of two types most frequently employed, Formica and Warerite, are illustrated. 12 illustrations. M.W.

PLASTICS—TESTING

NASON, H. K., CARSWELL, T. S., and ADAMS, C. H. Low temperature behavior of plastics. Modern Plastics 29, no. 4: 127-8, 130, 134-6, 138, 140, 198, 200-1, 203 (December, 1951).

When exposed to low temperatures, organic plastics undergo changes which may be classified as reversible and irreversible. Reversible effects usually include dimensional changes which result from thermal contraction and loss of moisture, increased yield and ultimate strengths, decreased ductility, and most frequently, decreased resistance to impact. Irreversible effects may include dimensional changes which result from a change of state, physical failure as a result of insufficient ductility to respond to dimensional changes, crystallization, and freezing of plasticizers or absorbed water. In either case the extent and rapidity of every change varies according to specific environmental conditions and the particular material involved. Data are presented to illustrate these effects on various plastics, including paper-base laminates. The lack of data at low temperatures for such properties as fatigue strength, stress endurance, and electrical constants is pointed out. 6 tables, 41 figures, and 39 references. M.W.

POLYSACCHARIDES

DEUEL, H., and SOLMS, J. Electrolyte coagulation of water-soluble polysaccharides and other high polymers. Kolloid-Z. 124, no. 2: 65-9 (November, 1951). [In German]

Data are presented in text and tabular form which show the sensitivity of certain water-soluble polysaccharides and other high polymers (including many mucilages) to coagulation with a number of organic and inorganic electrolytes. The coagulation behavior of these compounds may be used for their qualitative detection. 2 tables and 35 references. E.S.

PRINTING AND PRINTER'S INK

CARLSSON, GÖSTA E., PIHL, L., and DAHLSTRÖM, B. Studies of the ink transfer in a proof press. Grafiska Forskningslaboratoriet Medd. no. 26: 51-64 (May, 1951). [In Swedish; English summary]

The general principles of adhesion are discussed, and an account is given of some measurements of the ink transfer and the distribution of ink on different parts of the inking system in a Vandercook proof press no. 4. The ink which is transferred to the plate is proportional to the amount of ink in the inking system. The ink layer is thicker on the steel rollers than on those made of rubber, glue, or plastics. There is more ink on rubber than on glue rollers, but the ink transfer to the plate is greater with glue rollers. Any noticeable difference between the ink transfer to different materials in the form, such as zinc, copper, aluminum, chromium, nickel, and bakelite, could

not be observed, but it was found that a newly electrolytically deposited layer of copper on zinc received more ink than pure zinc. 5 tables, 3 figures, and 1 reference. E.S.

MATHER, JOHN P. News ink advances. Am. Ink Maker 24, no. 12: 39, 41 (December, 1951).

Reference is made to recent technical advances in the carbon blacks used in news inks and the aging of news ink. The causes and remedies for some common pressroom complaints, e.g., show-through, strike-through, offset, ghosting, smudge, and flying or misting, are discussed, and the advantages of R.O.P. color advertising and the Dayco color separator are mentioned. M.W.

PIHL, L. The origin of "ghost printing." Grafiska Forskningslaboratoriet Medd. no. 26: 65-7 (May, 1951). [In Swedish; English summary]

When boxboard is printed by offset, a weak image of the print which is not caused by setoff may appear on the back of the sheet, so-called ghost printing. It was found that this image was caused by volatile fatty compounds in the ink, which condense on the back of the overlying sheet in a pile. The phenomenon may also occur when there is a small space between the sheets. It was found that the driers in particular contain such volatile substances. 1 figure. E.S.

REYNOLDS, AL. Spotty ink drying. Share Your Knowledge Rev. 33, no. 3: 16-17, 24 (December, 1951); *cf.* B.I.P.C. 22: 197.

Some of the factors which influence the balance between ink and paper and the variables which cause different drying results under varying conditions are discussed briefly. M.W.

ROSEN, NAT. Crystallization phenomena. Am. Ink Maker 24, no. 12: 37-8, 65 (December, 1951).

A report is presented which is concerned with the surface-tension type of ink crystallization wherein the second color "crawls" and does not print satisfactorily over the first color. This study was prompted by the crystallization of a yellow gloss ink which was printed over black on a magazine cover. The influence of the pigment, the type of black ink, and the type of paper were investigated. The results indicate that there is danger of crystallization when a highly resinated benzidine yellow in a gloss vehicle is used, and that this is particularly pronounced on machine-coated paper, but can also occur on conversion-coated paper. The tendency toward crystallization is further enhanced by any printing that may appear on the reverse side of the sheet. 3 tables and 3 figures. M.W.

PRODUCTIVITY

ANGLO-AMERICAN COUNCIL ON PRODUCTIVITY. Carton production in the U. S. Brit. Printer 64, no. 380: 66-8 (September-October, 1951).

A report of the Productivity Team representative of the carton industry is presented which is based on information gathered during a tour of the U. S. The greater productivity of American plants is attributed to a variety of factors which include the better diet of American workers, relatively lower taxation, and the enlightened attitude of labor organizations, in addition to the superiority of boxboards and the larger average order of cartons common

to the American industry. The printing practices which are used in the U. S. are described and contrasted with British methods. M.W.

ANGLO-AMERICAN COUNCIL ON PRODUCTIVITY. Paper and print. World's Paper Trade Rev. 136, no. 18: 1250, 1252, 1255-6 (Nov. 1, 1951).

Excerpts from the report of the Lithographic Printing Productivity Team are given, with particular reference to paper and board (ordering, method of delivery, storage and handling, maturing, tests, Kromecote stock, cartons, handling of waste, and paper shortage). E.S.

RESEARCH

BANKS, W. H. Paper research in the United States. World's Paper Trade Rev. 136, no. 21: 1467-8 (Nov. 22, 1951).

Excerpts from the report "A study of some aspects of scientific research as applied to the graphic arts industry of America" are given, including methods of laboratory control, microscopy of paper fibers, and the educational and research work at The Institute of Paper Chemistry. E.S.

RESEARCH LABORATORIES

ANON. New research laboratories; important strides in gelatine and glue industry. World's Paper Trade Rev. 136, no. 24: 1719-20, 1725-6, 1728 (Dec. 13, 1951); Chemistry & Industry no. 52: 1162-3 (Dec. 29, 1951)

On June 30, 1948, the British Gelatine and Glue Research Association was incorporated; the official opening of the research laboratories at Holloway, London took place on November 29, 1951. A history of the research association is given, and its functions, program, and accomplishments to date are reviewed. 2 illustrations in first reference. E.S.

RESIN, SYNTHETIC—IDENTIFICATION

GILES, C. H., and WATERS, C. An identification scheme for textile finishing agents on the fibre. J. Textile Inst. 42, no. 10: P909-32 (October, 1951).

An identification scheme is described for the routine qualitative examination of more than 60 finishing treatments on cellulosic fibers. An example is given of a preliminary examination involving gentle heating, water spotting, testing for nitrogen and chlorine, and microscopic observation of its behavior with cuprammonium hydroxide solution. According to the results of this preliminary examination, the sample is subjected to further tests in one or the other of a series of systematic tables. No special apparatus is required, apart from a microscope, although an ultraviolet lamp may be used in a few cases. An identification may often be made successfully on less than a single square inch of fabric. In some cases, the method can be used with paper and fibers other than cellulose or for plastic materials in substance. 2 appendixes, 9 tables, and 17 references. E.S.

ROOFING FELTS

JOP. Remarks concerning roofing felts. Wochbl. Papierfabr. 79, no. 19: 609-10 (Oct. 15, 1951). [In German]

Directions for the selection, application, and maintenance of single-layer tarred roofing, built-up roofing with or without surfacing granules, and asphalt-prepared roll roofing are given. E.S.

SAFETY

MERCIER, R. Truck and tractor accidents in forest operations. Pulp Paper Mag. Can. 52, no. 12: 180, 184-5, 187 (November, 1951).

The circumstances of some of the fatal accidents which were caused by trucks and tractors are described, and precautionary measures are suggested. M.W.

NATIONAL SAFETY COUNCIL. Safe practices . . . in corrugated box manufacture. Boxboard Containers 69, no. 708: 40, 42, 44 (December, 1951).

A series of photographs are presented to illustrate safety practices at the Stone Container Corp., Chicago. Illustrations of staged unsafe practices are also included. 15 illustrations. M.W.

PAPER INDUSTRY. Accident-free record at U. S. Gypsum's Oakmont plant. Paper Ind. 33, no. 9: 1048-50 (December, 1951).

The safety program of the Oakmont plant in Pennsylvania is outlined, where kraft paper is produced and converted into multiwall plaster and lime bags. 7 illustrations. E.S.

SOUGHTON, FRED O., and ROWLANDSON, GORDON. Safety in caustic and recovery operations. Paper Ind. 33, no. 9: 1055-6 (December, 1951).

The principal hazards of caustic operations in a sulfate mill are outlined, and necessary safe methods and precautions are described. E.S.

SALESMEN AND SALESMANSHIP

GEIST, ELLSWORTH. Six precautionary measures to meet the return of competitive selling. Am. Paper Merchant 48, no. 12: 16, 55 (December, 1951).

Although in the past 10 years the paper market has fluctuated in such a way that competitive selling was not always required, there are indications that a strong market will exist during the first half of next year, and merchandisers will be forced to compete for the favor of buyers. To meet this competition, the merchandiser should analyze the past records of buyers and suppliers and, when necessary, institute a realistic reassignment of accounts. M.W.

HAND, JACK. How to get a slice of the prepackaged meat market. Paper Sales 11, no. 12: 14-15, 30 (December, 1951).

Some suggestions for the paper merchant to follow in obtaining a market in the retail meat business are presented which are based on the experience of Bond-Sanders of Nashville, Tenn. A thorough understanding of a meat packaging operation is required of the salesman, and he should concentrate on a minimum of prepack materials which will permit varied applications. M.W.

L. Q. Y. Explore the grocery store market. Am. Paper Merchant 48, no. 12: 18 (December, 1951).

The results of a recent survey by Selling Research, Inc. as to the extent of

usage by grocery stores of 33 specific nonfood items showed an over-all penetration of 62% into the grocery field. The list includes many items already stocked by paper wholesalers and others which could easily be handled by them. Only service and merchandising are necessary for paper merchants to expand their sales by contacting the grocery field. M.W.

SEMI-CHEMICAL PULPING PROCESS

WELLS, SIDNEY D. History and development of semichemical pulping. Paper Trade J. 133, no. 24: 32, 36, 40 (Dec. 14, 1951).

An outline of the development of high-yield semichemical pulping methods is presented. M.W.

SETUP BOXES

FRA. Calculations for cardboard boxes. (XI). Allg. Papier-Rundschau no. 21: 895-7 (Nov. 12, 1951). [In German] *cf.* B.I.P.C. 22: 279.

A sample calculation is given of the cost (in Germany) of a covered and lined gift setup box with hinged lid for silk scarfs; for easy opening, the lid is provided with a brass knob. 1 illustration and 2 tables. E.S.

SHIPPING CONTAINERS—TESTING

KELLICUTT, K. Q., and LANDT, E. F. Basic design data for use of fibreboard in shipping containers. Fibre Containers 36, no. 12: 62, 67-8, 70, 75-6, 78, 80 (December, 1951).

The authors discuss procedures for the scientific analysis of fiber containers and the development of some basic design criteria. The materials and test methods used in this investigation included: component paperboard sheets which were subjected to ring-crush, modified ring-crush, and strip column tests; built-up corrugated boards which were given bending, shear, and flexural-shear tests; fiberboard structures consisting of four panels representing a box without top or bottom which were given compression tests; and conventional slotted boxes which were given compression tests and which were also tested in a revolving drum with can-type loads. From the results of these tests, formulas were developed and, to simplify their application, several alignment charts were drawn. The use of the basic information obtained in this study is illustrated by a hypothetical problem, i.e., the selection of the proper component paperboard sheets which have the desired strength properties for the use requirements of the box to be constructed. 2 tables, 5 figures, and 16 references. E.S.

SORBITOL

ATLAS POWDER COMPANY. Stable supply ensures greater use of sorbitol and related polyols. Can. Chem. Processing 35, no. 11: 916-18, 920 (November, 1951).

The properties and some of the industrial uses of sorbitol, which is prepared commercially by the hydrogenation of corn sugar, are described. Because of its ability to control moisture content, it is employed as a protection against excessive moisture or dryness in a variety of products including specialty papers, such as glassine and parchment. 8 illustrations. M.W.

SPECIFICATIONS

COUGHLIN, E. T. A. Some phases in the development of military

specifications on paper and paper products. Tappi 34, no. 12: 105-7A (December, 1951); *cf.* B.I.P.C. 21: 715.

The development of Quartermaster Corps specifications and their relationship to the actual requirements of the products are discussed. E.S.

STARCH

THOMPSON, A., and WOLFROM, M. L. Degradation of amylopectin to panose. J. Am. Chem. Soc. 73, no. 12: 5849-50 (December, 1951).

By the use of a combination of carbon and silicate chromatography a trisaccharide, 4-α-isomaltopyranosyl-D-glucose or panose, has been isolated as its crystalline glycitol dodecaacetate from a reduced acid hydrolyzate of amylopectin. The hydrolysis was carried to 70% completion, since calculations showed that at this point a maximum yield of trisaccharide would be produced. The isolation of panose, which contains one α-1,6 link, from this hydrolyzate constitutes further evidence for the theory that branching occurs at the six position of D-glucose in the amylopectin molecule. 20 footnotes. E.S.

STATISTICAL METHODS

SHAW, GEORGE R. Quality control charts for the pulp and paper industry. Pulp Paper Mag. Can. 52, no. 12: 116-18 (November, 1951).

A system of control charts developed for the pulp and paper industry is given as an example; since the problems of no two mills are alike, modifications should be made to suit individual conditions. The advantages of the intelligent use of such charts and other statistical tools to the industry are emphasized. 1 table and 1 diagram. E.S.

STEAM POWER

TOBEY, J. E., HARDY, C. F., and JORDAN, A. L. Design trends in boiler installations in the pulp and paper industry in the South. Tappi 34, no. 12: 10A, 12A, 14A, 16A, 20A, 22A, 24A, 26A, 28A (December, 1951); *cf.* B.I.P.C. 18: 296.

The results of a survey of 37 pulp and paper mill boiler plants in 11 southern states are presented, including 283 boilers of which only 59 had been installed prior to 1936, and 109 since 1945. The fuels burned comprise pulverized coal, oil, natural gas, bark, and black liquor; many of the boilers are designed for two or even three types of fuel. Design data on the different boilers are given in tabular form. 5 tables, 1 map, and 1 reference. E.S.

STEAM TURBINES

RÖDER, KARL. The steam turbine in the industrial power plant. Wochbl. Papierfabr. 79, no. 15: 479-80 (Aug. 15, 1951). [In German]

The development of small steam turbines which will handle small quantities of steam efficiently at high pressures is discussed. 2 diagrams. E.S.

STRAW

FALDNER [JOSEF] The cooking of straw with sodium sulfite liquors. Wochbl. Papierfabr. 79, no. 21: 678 (Nov. 15, 1951). [In German] *cf.* B.I.P.C. 22: 282.

Referring to the unsatisfactory experiment of the German mill with a sodium sulfite straw cook, the author postulates that the sodium monosulfite in the digester reacted with the calcium oxide to form unreactive calcium sulfite and caustic soda, so that no sulfite cook at all took place; the active cooking agents were caustic soda and caustic lime, which is also substantiated by the almost node-free quality of the resulting pulp. Unfortunately neither caustic soda alone nor any quantities of sodium sulfite are capable of dissolving the silicic acid of the straw nodes. E.S.

FALDNER, JOSEF. Straw pulp and methods for its manufacture. Wochbl. Papierfabr. 79, no. 16: 511-12; no. 19: 607-9; no. 20: 639-41 (Aug. 31, Oct. 15, 31, 1951). [In German]

Reference is made to the article "Research on straw pulp" by Renaud (*cf.* B.I.P.C. 20: 904-5), and some of the tabular data of the French original are reproduced; the individual processes and the required installations, including bleaching procedures and waste-liquor problems, are discussed and evaluated under the subheadings: straight caustic soda, modified caustic soda, and chlorine procedures. The author considers the monosulfite process the most suitable for straw, because it is not surpassed by any other method with regard to pulp yield and quality. Its principal disadvantage is the high cost of chemicals which cannot be recovered from the waste liquors and which present stream-pollution problems. The author has developed a procedure according to which monosulfite can be prepared directly from sodium chloride and sulfur or sulfurous acid, respectively, without the use of caustic soda. The process is at present being investigated by a large chemical company and, if found applicable to large-scale operation, will signify a considerable reduction in the cost of monosulfite and even make recovery probable. 5 tables. E.S.

LATHROP, E. C. Research helps solve strawboard industry's problems. U. S. Dept. of Agr. Agr. Research Adm. Research Achievement Sheet 141(C): 2p. (July, 1951).

As a result of investigations by the Northern Regional Research Laboratory, the problem of storage loss of wheat straw which is used in the manufacture of corrugating paper and strawboard has been solved. A series of tests on several preservatives showed that borax or boric acid spread over the upper three tiers of ricks in which the straw is stacked in mill yards will effectively prevent rotting. 7 references. M.W.

STREAM POLLUTION

WISE, WILLIAM S. Water pollution control. Chem. Eng. News 29, no. 49: 5120-4 (Dec. 3, 1951).

The author discusses the importance of adequate water pollution control, summarizes the recent research and resulting methods, and stresses the need for a co-ordinating agency to establish industrial standards and to administer a reasonable and effective industrial program. Some statistics, which are broken down geographically, on the extent to which municipalities and industries are employing effective pollution controls are presented. 6 figures and 7 references. M.W.

SULFITE WASTE LIQUOR

HOUGH, B. K., and SMITH, J. C. Sulphite waste liquor chrome-lignin soil process. Paper Trade J. 133, no. 24: 40 (Dec. 14, 1951); Ind. Labs. 3, no. 1: 73 (January, 1952); Chem. Eng. News 30, no. 1: 74, 76 (Jan. 7, 1952).

A process for utilizing spent sulfite liquor as a soil solidification agent is described. The addition of 3-10% of concentrated spent liquor and much smaller quantities of sodium or potassium bichromate imparts considerable cohesive strength to soils and makes them almost impervious to water. Laboratory and field tests have shown the process to have promise for stabilization of highway subgrades, production of synthetic aggregate by soil briquetting, and stabilization of loose, dry beach sand by penetration methods. M.W.

WILEY, AVERILL J. Spent sulphite liquor studies. I. Program of the Sulphite Pulp Manufacturers' Research League, Inc. Tappi 34, no. 12: 553-6 (December, 1951); *cf.* B.I.P.C. 22: 60.

The Sulphite Pulp Manufacturers' Research League was originally organized in 1939 for developing methods of disposal for calcium-base spent sulfite liquor. The program for research and development of feasible processes has been expanded steadily in succeeding years into the fields of process and product development. The organization of the League is described. Research activities include development of: (1) processes utilizing the unmodified spent liquor or crude concentrates, (2) processes based on use of the lignin compounds and organic derivatives of lignin, (3) processes based on use of the wood sugars and their conversion products, and (4) recovery of pulping process values and other minor fractions. Evaluated processes with most promise for commercial development to date include evaporation and burning and production of torula yeast. Uses of the liquor as a dust-laying agent and as a possible medium for soil-base stabilization on unsurfaced and surfaced roads are being further developed. 4 references. E.S.

WILEY, A. J., KUMMER, M. F., FAULKENDER, C. R., and VAN CAMP, BERNARD. Spent sulphite liquor studies. III. Laboratory and commercial trials of spent sulphite liquor-asphalt emulsions for briquetting of coal. Tappi 34, no. 12: 556-60 (December, 1951).

Formulas for spent sulfite liquor-asphalt emulsions developed at the University of Wyoming's Natural Resources Institute have been subjected to commercial trial at briquetting plants of The C. Reiss Coal Co. Further laboratory and pilot-scale work has been carried out by the Sulphite Pulp Manufacturers' Research League and the Hoberg Paper Mills in co-operation with Komarek-Greaves & Co. Coal briquets with exceptional degrees of final strength, with good weathering characteristics, and with excellent resistance to growth of mold organisms have been prepared. Laboratory methods and standards for production of briquets with high, early strength immediately after leaving the press have been established, and commercial methods are under development. The economy of briquetting with this type of binder is being studied, and comparative figures are presented. 1 table, 9 figures, and 2 references. E.S.

SULFUR

INTERNATIONAL MATERIALS CONFERENCE. *Sulfur Committee.* Free world sulfur requirements charted. Chem. Week 69, no. 25: 14-15 (Dec. 22, 1951).

Data on sulfur requirements and production are presented which were prepared from replies to questionnaires sent to interested countries of the free world. These data indicate a world shortage of sulfur in 1952 amounting to 1,340,700 tons. 2 tables and 2 figures. M.W.

TALL OIL

SANDERMANN, WILHELM. Studies on resins. XV. The refining

of tall oil by distillation. Holz Roh- u. Werkstoff 9, no. 10: 378-82 (October, 1951). [In German] *cf.* B.I.P.C. 19: 700.

Tall oil, depending on the pulpwood species from which it is recovered, consists of 30 to 60% resin acids (I) and 60 to 30% fatty acids (II), oxy acids, and unsaponifiable matter (III). The preferred method of refining is by distillation, and the best separation of (I) from (II) is obtained by means of fractional distillation. The author investigated the possibilities of such a separation in a special pilot plant with spherical or plate-type columns, respectively, as well as the reasons for the high yield of sulfate pitch in a number of laboratory experiments. During distillation the dark-colored components and a part of the sulfur compounds remain in the forerun, whereas the main distillate contains only traces of sulfur. The principal portion of the sulfur passes to the sulfate pitch. The (I) fraction exhibits a strong tendency for crystallization which extends even to temperatures as high as 120°C., although it reaches a maximum between 50 and 80°. Since the (I) distillates frequently remain within this temperature range for prolonged periods, they are often extensively crystallized. This renders this fraction less suitable for many technical applications and may also cause serious clogging of pipes. Specially treated, noncrystallized tall oil rosin is now on the market and has given very satisfactory results as a paper size. The separation of (III) from the (II) distillate is more complicated than that of (I) from (II); however, with a sufficient number of separating plates it should be possible to reduce the (III) content in the (II) fraction to a maximum of 2%. 2 tables, 8 figures, and 24 references. E.S.

TEXTILE INDUSTRY AND FABRICS—FIREPROOFING

LITTLE, R. W. Fundamentals of flame retardancy. Textile Research J. 21, no. 12: 901-8 (December, 1951).

The reactions which occur in the burning of cellulose textile fabrics and the mechanisms by which these combustive processes can be retarded are discussed. The two types of active combustion—gas-phase reactions (flaming), and direct reactions between solid fuels and oxygen (glowing)—involve different oxidative reactions and must be considered independently when studying the function of combustion inhibitors. The principal effect of an efficient flame retardant appears to be the reduction in the amount of combustible tarry products and a corresponding increase in the amount of solid char formed. An accompanying increase in the amount of water evolved also occurs which serves to dilute the combustion vapors. Some flameproofing salts (e.g., mixtures of borax and boric acid) have been shown to function primarily by a physical mechanism in that they produce a foam which serves as a thermal insulation of the fabric. Other types (e.g., ammonium phosphate) enter into a chemical relationship with the fiber and either promote the decomposition of cellulose in the direction of solid char and water or, through hydrogen-bonding tendencies, promote an increase in the size of fragments formed on decomposition and a corresponding increase in the amount of solid residue. The mechanism attributed to glowing combustion is an initial formation of carbon monoxide followed by the formation of carbon dioxide in a secondary reaction. Glow retardants exert their maximum effect in inhibiting the secondary reaction, and the effective compounds include the thermolabile borates and phosphates and, to a lesser extent, inorganic silicates and certain organic polymeric resins. Studies of the combustion of untreated and treated cotton fabrics indicate that inhibition of glowing combustion occurs by means of a catalytic effect on the course of the oxidation of carbon with the preferential formation of carbon monoxide. Apparently this reaction produces insufficient heat to support a self-sustaining glowing reaction. As a confirmation of these observations some similar studies

concerning the effect of various reagents on the oxidation reactions in the combustion of coke are discussed. 3 tables, 6 figures, and 4 references. M.W.

VIBRATION

ROSS, FULLER. Modern paper mill machinery vibration elimination. Pulp Paper Mag. Can. 52, no. 12: 121-2 (November, 1951).

Emphasis is placed on the importance of the elimination of vibration from machinery in the pulp and paper industry, and certain fundamental rules are outlined. Reference is made to the wide selection of unit isolators available, so that each job need not necessarily have to be a specially tailored one, although general recommendations for isolating any type of machinery should not be made. The use of rubber, cork, and vibration eliminator rails is discussed. 2 illustrations. E.S.

WASTE PAPER

MIDWEST CONSUMERS OF WASTE PAPER. *Public Relations Committee.* [Materials that cause most damage to paperboard and paperboard machinery] Tappi 34, no. 12: 72A, 74A, 76A (December, 1951).

From a manual published by the association to point out what materials should be excluded from waste paper and why, a list of the objectionable materials is reprinted; it covers objectionable papers (black, glassy, contaminated-bag, and moisture-resistant papers), metals, rags, rubber, rubbish, string, wire, wood excelsior, and metal foil. The importance of furnishing a readily salable commodity is stressed; a mill buying a 1000-pound bale of waste paper expects to receive 1000 pounds of usable paper. E.S.

RADIO CORPORATION OF AMERICA, *Camden, N.J.* Electronic metal detector. Fibre Containers 36, no. 12: 178 (December, 1951).

Reference is made to the device for detecting any kind of metal or alloy, which has found wide application in the food, plastics, rubber, textile, packaging, and similar industries, and its use for the sorting of quality waste paper is recommended. E.S.

WAXES

CHEMICAL WEEK. Cane wax gain. Chem. Week 69, no. 25: 23-4 (Dec. 22, 1951).

A new process for the refining of sugar cane wax has been developed by a team of Australian scientists. The process consists of demineralization with hydrochloric acid, vacuum distillation to remove the components of lower molecular weight, and a chromic acid bleach which is based on the I. G. Farbenindustrie method for bleaching montan wax. Although it provides a more flexible wax and can employ crude from different mills, it would be more expensive than the solvent extraction process in use in the United States. 1 illustration. M.W.

WET STRENGTH

HAWTHORNE PAPER COMPANY, *Kalamazoo, Mich.* Hawthorne employs new resin to wet-strengthen Army map paper. Paper Mill News 74, no. 49: 68, 116 (Dec. 8, 1951); *cf.* B.I.P.C. 22: 287.

The Hawthorne Paper Company is now employing a new wet-strength resin, Uformite 700, in the production of Army map paper. Uformite 700

provides ease of handling and rapid wet-strength development. It is adaptable to a variety of furnishes, produces uniform results, and improves the surface characteristics of coated stocks. Acid pretreatment of the resin is unnecessary, and it may be added at a number of points in the papermaking operation. It is unaffected or even improved by the presence of sulfates. 3 tables. M.W.

TROUT, PAUL E. The mechanism of the improvement of the wet strength of paper by polyethylenimine. Tappi 34, no. 12: 539-44 (December, 1951).

Polymers of ethylenimine having D.P.'s in the neighborhood of 100 were prepared in laboratory quantities. The chemical behavior of the resins was typical of that of the secondary amines; the most interesting aspect was the cross linking of the polymer molecules by the action of formaldehyde. Physically, the polymers behaved like polyvalent electrolytes, which ionize in aqueous solution. This ionization of polyethylenimine was found to be an important factor in its retention by cellulose. Investigation of the retention mechanism showed it to involve a cation-exchange reaction. By this reaction polyethylenimine cations replaced the hydrogen ions or metal ions of the carboxyl groups present in the cellulose. In support of this theory, it was experimentally demonstrated that an increase in the polymer concentration displaced the equilibrium to the right, i.e., increased retention. Addition of hydrogen ions or of sodium hydroxide decreased polymer retention. Neutral salts, as expected, decreased polymer retention only slightly. The measured heat of polymer sorption was also compatible with a cation-exchange mechanism. The final link in the chain of evidence was the fact that the sodium content of the equilibrium sorption liquor increased as the polymer retention of the pulp increased. The wet-strength mechanism of polyethylenimine comprises the cross linking of the fibers by polymer bridges between the carboxyl groups of adjacent fibers—a simple and logical extension of the retention mechanism. This was deduced from the experimental observations that cross linking of polyethylenimine-treated fibers by formaldehyde increased wet strength; that the wet strength imparted by polyethylenimine alone developed under conditions precluding polymer-to-polymer cross linking; and that increasing amounts of sodium were freed from sodium oxycellulose handsheets as the wet strength of the sheets increased. 5 tables, 7 figures, and 23 references. E.S.

WHITE WATER

BASS, J. H., and EVANS, R. R. Sedimentation and flocculation equipment for treatment of industrial wastes. Sewage Ind. Wastes 23, no. 12: 1523-32 (December, 1951).

A brief review on the application of flocculation and clarification equipment (Vorti-Floc, Accelator, Cyclator units) in industrial waste treatment is presented, in which reference is made to the use of this type of treatment for asbestos paper wastes, where it has proved to be very effective. 5 tables, 5 figures, and 3 references. M.W.

WILLIAMSON, HARRY. Paper and paperboard making. XX. Closed white water systems. Paper Ind. 33, no. 9: 1051-3 (December, 1951); *cf.* B.I.P.C. 22: 239-40.

The principal purpose of a circulating white-water system on a paper machine is the retention in the sheet of components of smaller particle size than the wire mesh (fines). Fines form a most important constituent of the finished paper, and a variation in their proportion always results in the

variation of one or more qualities of the finished paper. The retention of fines is governed by the physical density of the forming sheet and the degree of colloidal affinity (hydration) developed on the base-furnish fibers. Lighter sheets made at higher speeds exhibit a lower density and will retain less fines than the heavier sheets produced at lower speeds. The cure for retention losses lies principally in the control of the degree of hydration necessary to create the colloidal affinity of the base furnish for the fines. A secondary aid is the control of the physical dimensions of the fibers. Reference is made to a chart presented in a previous section of this series of articles (*cf.* B.I.P.C. *22*: 162) which presents an actual example of these conditions. In conclusion, the troubles resulting from an excessive amount of foam-killing agent (I), i.e., the creation of slime spots, and the need for the careful regulation of the volume and strength of (I), a necessity in closed white-water systems, are discussed. E.S.

WRIGHT, J. HOWARD. Practical operation of O C O system. Paper Mill News 74, no. 48: 10, 12-13 (Dec. 1, 1951); *cf.* B.I.P.C. 21: 278.

Following a description of the operation of the OCO system, the experience in its use of the S. Austin Bicking Paper Manufacturing Co., Downingtown, Pa., is summarized. The material of construction of the slurry pump is an unsolved problem, and the buildup of dissolved solids causes a foam problem. The closing up of both white water systems in the mill without the addition of a disinfectant promotes bacterial growth even at temperatures of 160-170°F. and a low pH. The advantages, however, include a reduction of 50% in the cost of primary chemical treatment with alum and a very substantial heat savings. It is possible to obtain 24 filter cycles with a throughput of 110,000-130,000 gallons on board-mill excess waters. Old top and bottom paper machine felts have been found to be ideally suited for use as the filter cloth. 2 tables. M.W.

WOOD—EXTRACTIVES

GOTTLIEB, SIDNEY, and BRAUNS, F. E. Occurrence of *d*-pinitol in red spruce (*Picea rubra*). J. Am. Chem. Soc. 73, no. 12: 5880 (December, 1951).

d-Pinitol was isolated in small yield from the dioxane-ether filtrate which was obtained in the course of the preparation of native lignin from red spruce (*Picea rubra*). 11 references. M.W.

WOOD—MENSURATION

WARBURTON, J. ARTHUR. Log block piles inventoried by air at savings of thirty per cent. Pulp Paper Mag. Can. 52, no. 12: 119-20 (November, 1951).

Reference is made to experimental block-pile air surveys by a Canadian paper company and to the satisfactory results obtained with them; the air-inventory method can also be applied to coal, sulfur, limestone, and similar piles. The cost will depend on the number of piles to be tallied, their size, the location of airport facilities, and the frequency of inventory; a saving of 25-30% may be expected, and the completed maps can be delivered much faster. The accuracy is virtually the same as that obtained with ground methods without the hazards involved in the latter and, in case of irregular piles, may be even better. 3 figures. E.S.

WOOD OPERATIONS

CARLSON, W. S. Mechanized logging at LongLac. Pulp Paper

Mag. Can. 52, no. 12: 138, 140 (November, 1951); *cf.* B.I.P.C. 22: 144.

The "Cross-hatch" skid-load operation, the yarding of 8-ft. wood, and the loading of 16-ft. wood are described briefly. M.W.

CARSON, A. H. C. Construction and layout of Marathon's camps. Pulp Paper Mag. Can. 52, no. 12: 154, 156 (November, 1951).

The physical features of a typical, permanently located logging camp which has recently been constructed are described. M.W.

WOOD ROOM

PAPER INDUSTRY. Flambeau improvement program. Paper Ind. 33, no. 9: 1054, 1058 (December, 1951); *cf.* B.I.P.C. 22: 288.

The new installations include a hot pond and woodroom improvements, as well as a new 500-kva. generator to replace one of the water-wheel grinders. 2 illustrations. E.S.

WOOD TRANSPORTATION

WITHENSHAW, G. Drott loading and truck hauling of 16 foot wood on the operation of Abitibi Power & Paper Co. Ltd., Port Arthur Woods Division. Pulp Paper Mag. Can. 52, no. 12: 144, 146 (November, 1951).

The adoption of cutting and skidding operations and the use of the Drott loader have resulted in several advantages including speedier production with fewer workers, ease of changing locations, and the elimination of "bull-work." 2 illustrations. M.W.

WOOD WASTE

BORCHGREVINK, AXEL. Waste problems of the sawmills. Norsk Skogind. 5, no. 10: 309, 311-14 (October, 1951). [In Norwegian; English summary]

Reference is made to the large quantities of wood waste which accumulate at the sawmills and which in Norwegian mills amount to approximately 45% of the sawlogs; slabs represent about 24% and sawdust, 12% of this waste. In the author's opinion, the possibilities for the reduction of these percentages are rather small; the real problem consists in finding methods and outlets for the efficient utilization of this waste. Developments in other countries are reviewed, particularly in the United States and Sweden. Although many possibilities have been quite thoroughly investigated, many of the solutions are still in a more or less experimental stage. 2 tables. E.S.

HANSSEN, LEIF J. Waste from sawmills as fuel. Norsk Skogind. 5, no. 10: 303-8 (October, 1951). [In Norwegian; English summary]

The use of sawmill waste as fuel is discussed, and it is shown that the calorific value of different grades of waste varies considerably; the influence of moisture content and wood density is pointed out. Different types of furnaces are described, and their suitability for wood waste is discussed. Some furnaces are well equipped for burning a combination of waste and some other kind of fuel. Experiments have shown that stokers can be so arranged that they will handle wood waste efficiently either alone or as a supplement to other fuel types. 2 tables and 8 figures. E.S.

Patent Section

Although the abstracts of the United States and Canadian patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and the* Canadian Patent Office Record *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents up to and including December, 1948, are available only as manuscripts or photostatic copies, and an estimate of the cost of a patent should be obtained from the Commissioner of Patents, Ottawa, Canada, in advance of the order. With January, 1949, printed copies of Canadian patents are available at 25 cents per copy of less than 50 sheets of printed matter. For patents of 50 sheets or over, the price is $1.00 per copy. Beginning with volume 21, the Canadian patents will be abstracted from the complete specifications.

ADHESIVES

CUBBERLEY, RICHARD H., HILL, LYMAN P., and MOHR, WILFRED J. Asphalt-base laminating adhesive. U. S. patent 2,578,001. Filed May 21, 1949. Issued Dec. 11, 1951. 3 claims. Assigned to The Patent and Licensing Corporation. [Cl. 260-758; changed to 260-732]

A hot-melt asphalt-base laminating adhesive which is suitable for use in the manufacture of flexible floor- or wall-covering material consists of about 17 parts of hydrogenated rosin, 17 parts of an alkali digester-reclaimed natural rubber, and 66 parts of an asphalt which has a softening point (A.S.T.M. ring and ball) of 180-190°F. (all parts by weight). The adhesive is characterized by low-temperature flexibility. E.G.S.

GOSS, WORTH C. Method of making lignin compound and product. U. S. patent 2,578,695. Filed June 26, 1948. Issued Dec. 18, 1951. 4 claims. Assigned to United States Sheetwood Company. [Cl. 260-124]

A method of making a high-temperature thermosetting resin comprises the steps of wet grinding brown rotted wood to a paste, adding ammonium hydroxide until the pH of the mixture is about 9.2, and reacting the neutralized substance with a phenol selected from the group consisting of resorcinol, pyrocatechol, phenol, cresylic acid, and cresol. E.G.S.

BAGASSE

ROMAN, CHARLES. Artificial wood product and method of making the same. U. S. patent 2,578,489. Filed Dec. 9, 1946. Issued Dec. 11, 1951. 12 claims. [Cl. 260-17.2]

An artificial wood product consists of a hard, dense, waterproof body which is obtained by the combination of the following ingredients: 1.5 lb. of fluffed sugar cane bagasse, a binder which includes 1-2 oz. of a thermosetting, urea- or phenol-formaldehyde resin adhesive, and a cereal flour extender (2 oz. of flour to 1 oz. of resin). 3 figures. E.G.S.

BARKERS AND BARKING

ÅSTRÖM, JOHAN. Rotatable hollow-head debarker mounting flexible bark-removing elements. U. S. patent 2,576,912. Filed Feb. 26, 1945. Issued Dec. 4, 1951. 8 claims. Assigned to Svenska Cellulosa Aktiebolaget. [Cl. 144-208]

A mechanical barker incorporates barking chains which are fixed in a rotatable supporting device that has a central opening through which a log can be fed. 9 figures. E.G.S.

LAULAINEN, EINER A. Apparatus for pressing bark-removing cables against a pile, pole, or log. U. S. patent 2,575,422. Filed Sept. 24, 1945. Issued Nov. 20, 1951. 8 claims. [Cl. 144-208]

A mechanical barker is constructed as a unit which can be mounted on a bulldozer as a power plant. A cable is provided for bringing a number of converging longitudinal forces to bear upon a given portion of bark on a log; a relatively wide circumferential section of bark is removed in a single pass of the device. 16 figures. E.G.S.

LEFFLER, NILS G. Machine for barking logs. U. S. patent 2,576,127. Filed Nov. 6, 1946. Issued Nov. 27, 1951. 11 claims. Assigned to Svenska Cellulosa Aktiebolaget. [Cl. 144-208]

A reciprocating barking member of a mechanical barker is a flexible element, such as a chain, wire, or the like, which is adapted to follow smoothly the contour of a log. 16 figures. E.G.S.

PAULEY, ROBERT D., and MCCANNA, LOUIS A. Apparatus for removing bark from logs. U. S. patent 2,576,967. Filed July 12, 1948. Issued Dec. 4, 1951. 10 claims. Assigned to Weyerhaeuser Timber Company. [Cl. 144-208]

A mechanical barker embodies a barking tool which has a bluntly rounded smooth surface that is adapted to ride over irregularities on the bark and exert the same compressive force progressively on different areas of the cambium layer. 10 figures. E.G.S.

PAULEY, ROBERT D., and MCCANNA, LOUIS A. Method of barking logs. U. S. patent 2,576,966. Filed Aug. 20, 1946. Issued Dec. 4, 1951. 9 claims. Assigned to Weyerhaeuser Timber Company. [Cl. 144-309]

A method of barking is described in which a moving pressure area is imposed against the bark layer momentarily to compress and then release the bark progressively in successive localized areas to cause the bark to break and separate itself from the underlying wood surface as the pressure area or wave moves over the bark. The pressure wave may be created by pressing a rigid tool in a substantially perpendicular direction against the surface of the bark and then moving the tool relatively over the bark to move the compressing action to successive new localized areas and to release compressed areas to permit re-expansion of the bark behind the moving tool. 5 figures. E.G.S.

SHAW, ERNEST C., and JENSEN, MELVIN L. Hydraulic barker with multiple nozzle oscillating linkage. U. S. patent 2,576,861.

Filed Nov. 18, 1948. Issued Nov. 27, 1951. 15 claims. Assigned to Allis-Chalmers Manufacturing Company. [Cl. 144-208]

A hydraulic barker incorporates oscillating water jets which are automatically adjusted to accommodate logs of various size in response to changes in the position of the jets in relation to a log conveyor bed. 6 figures. E.G.S.

BOARD—COATED

FISHER, HARRY C., and SOOY, BRAINARD E. Method for imprinting coatings on paper and paperboard. U. S. patent 2,578,345. Filed Nov. 23, 1946. Issued Dec. 11, 1951. 6 claims. Assigned to Consolidated Water Power & Paper Company. [Cl. 117-60]

A roll-coating process is described in which a clay coating is applied to a precoated (e.g., with polyvinyl alcohol, starch, or mixtures thereof) paper web, which completely masks the color of the paper; less than a 0.001-inch film of mineral coating added to the web before imprinting fulfills the purpose of the invention. This is related to U. S. patent 2,419,207; *cf.* B.I.P.C. 17: 597. 2 figures. E.G.S.

BOARD SPECIALTIES

CADMUS, EDGAR F. Method of packaging. U. S. patent 2,575,580. Filed Feb. 14, 1949. Issued Nov. 20, 1951. 14 claims. [Cl. 93-3]

A method is described for the formation of heavy-paper bottle carriers from a continuous web of the sheet material; the process is applicable to the packaging of bottles and cans which are moving on a conveyor and are being discharged from a bottling or canning machine. 11 figures. E.G.S.

CASLER, ROGER H. Bottle carrier. U. S. patent 2,575,654. Filed Sept. 16, 1946. Issued Nov. 20, 1951. 8 claims. Assigned to Roy S. Sanford. [Cl. 229-52; changed to 229-27]

A paperboard bottle carrier incorporates partition-forming members which are integral with the compartment side walls and which are so constituted as to strengthen and brace the side walls. 3 figures. E.G.S.

CRANE, WALTON B. Cellular container. U. S. patent 2,578,174. Filed April 1, 1949. Issued Dec. 11, 1951. 7 claims. Assigned to Alpak. [Cl. 229-52; changed to 229-28]

A paperboard bottle carrier incorporates a longitudinal partition and handle-forming members which comprise panels that are cut from extensions of the side wall-forming panels in such a manner as to provide transverse partition-forming strips which are adapted to extend in upstanding position between the longitudinal partition and the side walls. 7 figures. E.G.S.

FARRELL, JAMES A. Shipping pallet. U. S. patent 2,576,715. Filed Jan. 31, 1947. Issued Nov. 27, 1951. 6 claims. [Cl. 248-120]

A fiberboard shipping pallet which is designed to be stapled to the bottom of a carton incorporates fiberboard inserts or bracing cells which serve to stiffen and strengthen the carton against heavy loads. 10 figures. E.G.S.

HARRISON, JOHN K. M. Paper container. U. S. patent 2,578,244. Filed June 24, 1947. Issued Dec. 11, 1951. 1 claim. [Cl. 229-5.5]

A cylindrical chipboard container is adapted for the packaging of oils,

foodstuffs, and the like. The end closures are constructed in such a manner that the container can be opened without contamination of the contents by shredded end-wall material. 5 figures. E.G.S.

HOLY, MITCHEL E. Collapsible carrier. U. S. patent 2,576,179. Filed June 13, 1949. Issued Nov. 27, 1951. 2 claims. Assigned to Container Corporation of America. [Cl. 229-28]

A paperboard bottle carrier which is adapted for manufacture on high-speed folding carton machinery is erected by a simple hand manipulation and held in such condition by the assembly of a partition element with the carrier. 6 figures. E.G.S.

TOMARIN, HARRY A. Shield for garment hangers. U. S. patent 2,578,383. Filed Oct. 18, 1946. Issued Dec. 11, 1951. 5 claims. Assigned to Loroco Industries Incorporated. [Cl. 223-88; changed to 223-98]

A cardboard garment hanger shield incorporates a collar abutment member which is constructed and arranged to support the collar portion of garments against crushing and to anchor such garments against sidewise shifting on the hanger. 6 figures. E.G.S.

CHLORINE

PYE, DAVID J., and JOSEPH, WILLIAM J. Production of chlorine. U. S. patent 2,577,808. Filed Feb. 12, 1947. Issued Dec. 11, 1951. 4 claims. Assigned to The Dow Chemical Company. [Cl. 23-219]

A two-stage process for the production of chlorine comprises the reaction of ferric oxide with gaseous hydrogen chloride to yield ferric chloride and steam, and the subsequent oxidation of the ferric chloride in a stream of air to form ferric oxide and gaseous chlorine; the iron oxide is recycled for use in the first stage. The process embodies the use of a continuously moving bed of granular particles of the contact mass (e.g., ferric chloride as a source of chlorine, potassium chloride as a depressant of ferric chloride volatility, cupric chloride as a promoter, and an inert porous support or carrier) travels by gravity flow through successive zones of chloridization and oxidation countercurrently with hydrogen chloride and air. 1 figure. E.G.S.

DIELECTRICS

MILLER, HARRY F., and FLOWERS, RALPH G. Fibrous dielectric compositions. Canadian patent 478,877. Filed July 28, 1948. Issued Nov. 27, 1951. 8 claims. Assigned to Canadian General Electric Company.

A dielectric sheet material comprises the fibrous reaction product of a lignocellulose pulp and acrylonitrile in an aqueous sodium hydroxide medium, and a dielectric composition (e.g., castor oil or pentachlorodiphenyl). The fibrous material has a nitrogen content of 0.3-2.8%. The product is suitable for use in the manufacture of electrical capacitors. 1 figure. E.G.S.

DISPENSING CONTAINERS

GOLDSTEIN, SAUL. Dispensing container. U. S. patent 2,576,595. Filed March 18, 1949. Issued Nov. 27, 1951. 1 claim. [Cl. 229-17]

A cardboard milk container is provided with a rigid fulcrum point across the bottom of a pouring spout which is formed from one thickness of the

carton material and which is designed to contribute to the strength and rigidity of the spout. 7 figures. E.G.S.

GOLDSTEIN, SAUL. Method of forming a pouring spout blank. U. S. patent 2,576,594. Filed March 19, 1948. Issued Nov. 27, 1951. 1 claim. [Cl. 93-58]

A pouring spout for a cardboard milk container is adapted to co-operate with a sealing tongue formed in the carton wall to serve as a closure for the carton after initial use. 7 figures. E.G.S.

EVAPORATION AND EVAPORATORS—SULFITE WASTE LIQUOR

LOCKMAN, CARL J. Heat exchange apparatus. U. S. patent 2,576,843. Filed April 20, 1948. Issued Nov. 27, 1951. 4 claims. Assigned to Aktiebolaget Rosenblads Patenter. [Cl. 257-1]

A heat exchanger which is designed for the transfer of heat from vapors to a scale-forming liquid incorporates means for the circulation of condensate through the passages which are used intermittently as vapor passages to secure a more even flow of condensate over the passage walls and thus to increase the cleaning efficiency of the unit. 5 figures. E.G.S.

FLOOR COVERING

SLUITER, GERRIT J. Method of making fibrous products. U. S. patent 2,575,895. Filed Sept. 22, 1949. Issued Nov. 20, 1951. 5 claims. [Cl. 260-742; changed to 260-740]

A uniform fibrous product which is adapted for brushing, bulking, casting, or spraying as a covering material for walls, ceilings, floors, furniture, human bodies, or the like comprises, in intimate mixture, 75-100 parts of rubber latex, an aqueous glue dispersion which contains 5-25 parts by weight of glue, and 70-80 parts of loose cellulose fibers suspended in the mixture. 8 figures. E.G.S.

FOLDING BOXES

BERGSTEIN, SAMUEL. Mechanism and methods for making boxes with attached handles and the like. Canadian patent 478,802. Filed Aug. 18, 1948. Issued Nov. 20, 1951. 7 claims.

A one-piece boxboard garment box is constructed with adhesively attached kraft board handles and is adapted for manufacture on the machinery described in Canadian patent 464,561 and U. S. patent 2,554,004; *cf.* B.I.P.C. 20: 683; 21: 819. 29 figures. E.G.S.

BUTTERY, KENNETH T., and STENGER, RICHARD C. Collapsible trays or boxes and box members. Canadian patent 479,145. Filed Aug. 10, 1949. Issued Dec. 4, 1951. 6 claims. Assigned to Sutherland Paper Company.

A tray or box which is formed from an integral blank may be shipped flat and set up manually or by machine. This is the same as U. S. patent 2,488,705; *cf.* B.I.P.C. 20: 285-6. 7 figures. E.G.S.

DUBILIER, WILLIAM. Playing card container. U. S. patent 2,577,007. Filed June 12, 1947. Issued Dec. 4, 1951. 1 claim. [Cl. 229-16]

A container for a pack of playing cards is made of laminated, plasticized, or glazed paper and is provided with means for the retention of a key or scoring card in a clearly visible but secure position. 5 figures. E.G.S.

FOLDING BOXES, SIFTPROOF

BROOKS, LEWIS C. Consumer type container. U. S. patent 2,577,305. Filed March 23, 1949. Issued Dec. 4, 1951. 12 claims. Assigned one third to Ira M. Jones. [Cl. 229-37]

A paperboard food container is provided with a relatively wide, flat ledge which is flush with the top of the container body and makes a face-to-face engagement with the cover of the container; thus the secure attachment of the cover to the body is facilitated. 8 figures. E.G.S.

BROOKS, LEWIS C. Container. U. S. patent 2,577,304. Filed April 11, 1946. Issued Dec. 4, 1951. 9 claims. Assigned one third to Ira M. Jones. [Cl. 229-5.5; changed to 229-17]

A double-wall fiberboard container for household commodities and food is provided with shoulders or ledges at its opposite ends for the support of end closures; the ledges are formed by the bending of marginal extensions of the side walls inwardly to provide an inner reinforcing and insulating wall for the container. 4 figures. E.G.S.

INTERIOR PACKING

TADINGER, PAUL. Padding for packings and method of manufacturing the same. U. S. patent 2,575,898. Filed May 24, 1949. Issued Nov. 20, 1951. 3 claims. Assigned to Oscar L. Ladner. [Cl. 154-110]

A shock-absorbing cushion which is adapted for insertion into a shipping carton is formed by coating a web of corrugated board with an adhesive on the corrugations, immediately rolling it into a loose roll of elliptical or circular cross section and, while the adhesive layer is still in a sticky or tacky condition, compressing the body in a press to the desired shape under heat and pressure until a solidification of the shaped padding is effected. 6 figures. E.G.S.

LEATHERBOARD AND ARTIFICIAL LEATHER

LYNAM, THORNTON L. Method and apparatus for making fibrous sheet material. U. S. patent 2,577,784. Filed Feb. 7, 1946. Issued Dec. 11, 1951. 2 claims. Assigned to Fibre Leather Manufacturing Company. [Cl. 154-29]

A method is described for the deposition of leather fibers from an air suspension to form a shaped or sheeted product which possesses the characteristic fiber structure of leather made directly from animal hides. 4 figures. E.G.S.

MACHINERY—CALENDERS

PUTNAM, CHARLES P. Calender machine. U. S. patent 2,578,594. Filed Dec. 20, 1948. Issued Dec. 11, 1951. 5 claims. Assigned to New York and Pennsylvania Co., Inc. [Cl. 92-71; changed to 92-75]

A tandem-type supercalender includes swingably mounted, resilient, soft

fiber rolls which can be replaced without the necessity of a stoppage or slowdown of the machine. 3 figures. E.G.S.

MACHINERY—CHIPPERS

DUNWODY, ARCHIBALD B. Wood chipping processes. Canadian patent 478,960. Filed March 11, 1949. Issued Nov. 27, 1951. 6 claims. Assigned to Nekoosa-Edwards Paper Company.

A wood-chipping process involves the formation of wood chips from a cut log and the subsequent classification on a rifiler on the basis of apparent bulk density into a fraction suitable for the manufacture of top-quality paper, a second fraction suitable for the manufacture of lower grades of paper, and additional fractions which contain knots, dirt, bark, and other foreign materials. 4 figures. E.G.S.

MACHINERY—CONVERTING MACHINERY

NASH, FRANK L. Reinforcing asbestos-cement sheets. U. S. patent 2,578,581. Filed June 22, 1950. Issued Dec. 11, 1951. 4 claims. Assigned to Turners Asbestos Cement Company Limited. [Cl. 92-41; changed to 92-55]

A method is provided for the formation of long, wire-reinforced sheets of asbestos cement which may easily be cut into shorter lengths. 6 figures. E.G.S.

NASH, FRANK L. Reinforcing asbestos-cement sheets and apparatus for use therein. U. S. patent 2,578,580. Filed Aug. 18, 1948. Issued Dec. 11, 1951. 3 claims. Assigned to Turners Asbestos Cement Company Limited. [Cl. 92-67]

An apparatus is adapted for the formation of long, wire-reinforced sheets of asbestos cement in which the continuity of the reinforcing wires is interrupted along one or more lines which extend across the width of the sheet; this arrangement facilitates the cutting of the sheets into short lengths. 6 figures. E.G.S.

ROACH, EARL M. Carton lining device. U. S. patent 2,576,697. Filed May 17, 1945. Isued Nov. 27, 1951. 3 claims. Assigned to Arvey Corporation. [Cl. 93-36.01]

A mandrel-like device is adapted for the expanding and shaping of an initially flat liner bag to permit the liner to enter and conform to the interior surfaces of a rigid container. The device is designed for home use. 19 figures. E.G.S.

ROOKSBY, WILLIAM H. Apparatus for reinforcing asbestos-cement sheets. U. S. patent 2,578,598. Filed June 1, 1946. Issued Dec. 11, 1951. 10 claims. Assigned to Turners Asbestos Cement Company Limited. [Cl. 92-66]

In a rotating cylindrical apparatus which is designed for use in the manufacture of reinforced asbestos-cement sheet material, means are included for the introduction of reinforcing wires onto a forming bowl without a stoppage or speed reduction of the bowl. 13 figures. E.G.S.

SCHOEN, WALTER A. Method of producing sealed bags. U. S. patent 2,576,542. Filed March 22, 1948. Issued Nov. 27, 1951. 3 claims. Assigned to Milprint, Inc. [Cl. 93-3]

A method is described for the manufacture of a unitary, heat-sealed, commodity-receiving bag, which incorporates an external end pocket, from a continuous web of sheet material. 6 figures. E.G.S.

TOULMIN, HARRY A., JR. Apparatus for producing self-supporting wrinkle film. U. S. patent 2,576,317. Filed Jan. 14, 1947. Issued Nov. 27, 1951. Assigned to New Wrinkle, Inc. [Cl. 18-15]

An apparatus for the manufacture of wrinkle-textured films includes means for the automatic control of film thickness. 5 figures. E.G.S.

VERGOBBI, JOHN G. Bag forming machine. U. S. patent 2,577,386. Filed Aug. 14, 1946. Issued Dec. 4, 1951. 9 claims. Assigned to Pneumatic Scale Corporation, Limited. [Cl. 93-18]

An apparatus is designed for use in the production of Pliofilm liners for dehydrated food packages. The unit is provided with a mandrel or forming block and with means for opening a flat bag and transferring it to the block. 5 figures. E.G.S.

ZINN, JULIUS A., JR. Method and apparatus for closing and sealing containers. U. S. patent 2,575,544. Filed Jan. 26, 1949. Issued Nov. 20, 1951. 7 claims. [Cl. 93-6]

A method and apparatus are provided for closing and sealing paraffined paperboard containers of the type which have an open mouth portion scored along predetermined fold lines to form a fully depressible, bellows-type closure. 11 figures. E.G.S.

MACHINERY—CORRUGATING MACHINE

CARR, ALOYSIUS J. Corrugating machine. U. S. patent 2,576,281. Filed June 9, 1950. Issued Nov. 27, 1951. 10 claims. [Cl. 154-30]

A drive for a pair of corrugating rolls is arranged in such a manner that no twisting torque is imposed upon the shaft of the driven roll; such a torque would twist the corrugations and prevent them from centering. 4 figures. E.G.S.

MACHINERY—CURLATOR

COGHILL, JAMES T. Machines for treating wood pulp and the like. Canadian patent 478,299. Filed Nov. 24, 1949. Issued Nov. 6, 1951. 15 claims. Assigned to Consolidated Machine Tool Corporation.

A refiner includes a centrally disposed dewatering area in which the consistency of the stock is raised and the stock is nodulated, a lower working surface which is stationary and which surrounds the dewatering area, and an upper working surface which is given a continuous gyratory or orbital motion during the operation of the machine and which extends over the dewatering area and the lower working surface. 9 figures. E.G.S.

MACHINERY—DECORTICATING MACHINE

WRIGHT, WILLIAM E. Decorticator. U. S. patent 2,576,166. Filed May 3, 1947. Issued Nov. 27, 1951. 11 claims. Assigned to Sea Island Mills, Inc. [Cl. 19-11]

A decorticating apparatus incorporates a fiber-cleaning mechanism for cleaning the butt ends of fiber-bearing plants (e.g., ramie). 4 figures. E.G.S.

MACHINERY—DRYERS

HORNBOSTEL, LLOYD. Drier section for paper machines. U. S. patent 2,578,552. Filed Oct. 6, 1948. Issued Dec. 11, 1951. 10 claims. Assigned to Beloit Iron Works. [Cl. 34-121]

A gear-casing arrangement for paper machine drier sections embodies a flexible expansion joint which facilitates the removal of individual drier drums without the disturbance of adjacent equipment. 8 figures. E.G.S.

OSTERTAG, HARRY M., and MASSHARD, JOHN H. Yankee drier. U. S. patent 2,576,036. Filed Nov. 30, 1945. Issued Nov. 20, 1951. 11 claims. Assigned to Scott Paper Company. [Cl. 257-95]

A Yankee drier which is designed for use with high-pressure steam consists of an outer cylindrical cast iron shell and an inner steel shell which meets the standard specifications for unfired pressure vessels. The shells are spaced apart by hollow rims, one at each end, which also serve as annular steam chambers. 6 figures. E.G.S.

TREVISAN, BRUNO. Paper machines. Canadian patent 478,564. Filed Sept. 15, 1947. Issued Nov. 13, 1951. 7 claims. Assigned to Papierfabrik Balsthal.

Hot water is used as the heating medium in the drier rolls of a paper machine. It is claimed that accurate temperature control is facilitated. This is the same as U. S. patent 2,535,970; *cf.* B.I.P.C. 21: 517. 1 figure. E.G.S.

MACHINERY—FELTS

ALBRIGHT, CHARLES B. Drying and curing apparatus. U. S. patent 2,576,274. Filed Oct. 4, 1947. Issued Nov. 27, 1951. 12 claims. Assigned to The Orr Felt & Blanket Company. [Cl. 34-48]

A method and apparatus are provided for the drying and curing of resin-impregnated papermakers' felts in a continuous, automatic process. Radiant heat from gas-fired burners is used to heat the felt, and a large volume of air is drawn through the felt to carry the heat uniformly throughout the body of the felt during the drying and curing operations. 8 figures. E.G.S.

MACHINERY—HEAD BOX

HORNBOSTEL, LLOYD. Rectifier roll cleaned vane type flow spreaders. Canadian patent 478,859. Filed April 30, 1949. Issued Nov. 27, 1951. 7 claims. Assigned to Beloit Iron Works.

A flow spreader for the lateral distribution of stock flow onto a paper machine includes a number of laterally adjustable vanes and a rectifier roll which is located in the path of stock flow into the stock inlet box. 5 figures. E.G.S.

LEWELLEN, EMMONS F., and LEWELLEN, DARCY E. Control for papermaking machines. U. S. patent 2,576,614. Filed May 19, 1948. Issued Nov. 27, 1951. 10 claims. [Cl. 92-46]

A control mechanism for cylinder machines can be manually adjusted or automatically operated to control the thickness of the finished paper over a wide range of machine speeds. The device is designed to conform accurately to the time interval required for the stock to travel from the headbox to the caliper rolls. 11 figures. E.G.S.

MACHINERY—PACKAGING MACHINERY

GERLACH, CARL J. Machine for packaging merchandising rolls. U. S. patent 2,578,297. Filed Nov. 3, 1947. Issued Dec. 11, 1951. 7 claims. [Cl. 93-2; changed to 53-115]

A machine for the automatic, continuous packaging of paper rolls (e.g., toilet tissue) includes means for the application of wrappers or labels to the roll packages as the latter are fed through the machine. 13 figures. E.G.S.

KERR, CHARLES E., and ELSHEIMER, ROSCOE. Carton handling machine. U. S. patent 2,577,529. Filed July 8, 1946. Issued Dec. 4, 1951. 17 claims. Assigned to Food Machinery and Chemical Corporation. [Cl. 93-6]

A machine is provided for advancing collapsed one-piece cartons in a continuous flow past a carton-opening, -filling, -closing, and -discharge station; for opening and erecting the bodies of the cartons; for filling the erected cartons; for erecting the flanges of the covers of the filled cartons; for closing the covers; and for pressing the closed cartons into shape for subsequent wrapping or labeling. 53 figures. E.G.S.

MACHINERY—PASTING MACHINE

NITCHIE, CHARLES D. Box blank taping machine. U. S. patent 2,575,887. Filed May 26, 1949. Issued Nov. 20, 1951. 17 claims. Assigned to Samuel M. Langston Co. [Cl. 216-25]

A box-taping machine incorporates means for forming a free loop in the tape which is under practically no tension. Thus there is only a slight resistance to the sudden and rapid withdrawal of tape from the loop when the end of the tape is attached to a rapidly moving blank. 12 figures. E.G.S.

WEEKS, NORMAN E. Apparatus for adhesively uniting sheet materials. Canadian patent 479,081. Filed Nov. 17, 1947. Issued Dec. 4, 1951. 10 claims. Assigned to Bemis Bro. Bag Company.

An apparatus is adapted for the adhesive uniting of sheet materials, particularly paper valve sleeves in bag valves, by means of a thermoplastic adhesive. This is the same as U. S. patent 2,489,210; *cf.* B.I.P.C. 20: 289. 8 figures. E.G.S.

MACHINERY—REFINERS

ARPIN, EDMUND P., JR., and FRYE, RAYMOND P. Rotary refiners. Canadian patent 478,619. Filed Dec. 27, 1948. Issued Nov. 13, 1951. 13 claims. Frye's interest assigned to Arpin.

A rotary refiner is described in which each rotor stone is positively held in a housing or backing plate by means of a number of adjustable wedge-shaped members which are securely held in place by bolts. A pressure pad which is disposed between the rotor stone and several wedge members assures a uniform application of pressure on all parts of the stone, thus minimizing the possibility of stone rupture or uneven wearing of the stone surface. 8 figures. E.G.S.

MACHINERY—SAWS

CHARTERS, GEORGE W. Mechanical off-bearing flared rolls. Canadian patent 478,901. Filed March 9, 1949. Issued Nov. 27, 1951. 2 claims. Assigned to Crown Zellerbach Corporation.

Mechanical means are provided for the removal of a slab as it is sawed from a log and for the subsequent positioning of the slab with its flat or sawed face down. This is the same as U. S. patent 2,468,036; *cf.* B.I.P.C. 20: 534. 2 figures. E.G.S.

MACHINERY—SCREENS

COWAN, BEN, and COWAN, ELIJAH. Flat screens for pulp screening. Canadian patent 478,419. Filed Nov. 15, 1949. Issued Nov. 13, 1951. 3 claims.

A diaphragm-type flat screen embodies sealing means for preventing leakage between the walls of the diaphragm chamber and the marginal portions of the diaphragm. 4 figures. E.G.S.

MACHINERY—SLITTERS AND WINDERS

BACHMAN, CARL O. Winding machine. U. S. patent 2,578,461. Filed March 8, 1949. Issued Dec. 11, 1951. 12 claims. [Cl. 242-66]

A winder includes means for controlling the tension exerted on the convolutions of a roll so that as the outer diameter of the roll is approached, the outer convolutions may be more loosely wound than the inner ones. In this manner the likelihood of web breakage is diminished in the event that the roll is accidentally dropped on an edge. 10 figures. E.G.S.

HAMMOND, JOHN M. Contractile reel for paper cutting machines. U. S. patent 2,578,064. Filed Jan. 5, 1948. Issued Dec. 11, 1951. 3 claims. Assigned to Herman J. Minkus. [Cl. 242-111; changed to 242-72]

Means are provided for the stepwise rotation of a reel which is designed to effect the advancement of a paper web to a cutting element. 8 figures. E.G.S.

MACHINERY—SUCTION ROLLS

HORNBOSTEL, LLOYD. Suction roll seal assembly. U. S. patent 2,578,551. Filed March 5, 1948. Issued Dec. 11, 1951. 5 claims. Assigned to Beloit Iron Works. [Cl. 92-53]

Provision is made for a sealing strip for a suction gland and for a mounting assembly which includes an expansible tube for pressing the sealing strip against the suction roll and means for supplying water to lubricate the sides of the strip. This corresponds to Canadian patent 461,584; *cf.* B.I.P.C. 20: 369. 1 figure. E.G.S.

MACHINERY—VATS

HORNBOSTEL, LLOYD. Fluid pressure sealed garter straps for cylinder molds. Canadian patent 478,858. Filed March 9, 1949. Issued Nov. 27, 1951. 5 claims. Assigned to Beloit Iron Works.

A seal for Yankee-type paper machines is provided in which a sealing ring is urged into contact with the circular end faces of a rotatable cylinder mold by means of fluid pressure. 4 figures. E.G.S.

PACKAGING

IRMSCHER, HANS O. Packaging beverage infusor units having string handles and tags. U. S. patent 2,577,765. Filed June 26,

1948. Issued Dec. 11, 1951. 9 claims. Assigned to National Urn Bag Co. Inc. [Cl. 99-171]

A number of tea bags are packaged in a carton in such a manner that an individual bag can be removed by pulling an exposed tag which is attached to each bag. 7 figures. E.G.S.

JENETT, HENRY. Packaging material and method of packaging. U. S. patent 2,577,249. Filed April 19, 1947. Issued Dec. 4, 1951. 8 claims. [Cl. 93-3; changed to 53-5]

A packaged article (e.g., a lens) is enclosed in an envelope which is constructed from a cellophane-paper-cellophane laminate. The central portion of the paper layer is cut out to permit the display of the article. 10 figures. E.G.S.

O'BRIEN, HERBERT J. Packaging. U. S. patent 2,578,583. Filed April 13, 1949. Issued Dec. 11, 1951. 1 claim. [Cl. 206-65]

A corrugated or paperboard shipping container for canned or bottled goods comprises a number of smaller packages which can be readily divided to permit the sale and delivery of predetermined portions of a case lot. As an example, four individual cartons are combined by their adhesive attachment to a common flat sheet of corrugated board and the application of a top label to span the common point of contact of the four boxes. 5 figures. E.G.S.

SONNENBERG, RUDOLPH. Nested bottle cap package. U. S. patent 2,576,650. Filed Jan. 21, 1949. Issued Nov. 27, 1951. 1 claim. Assigned to Mid-West Bottle Cap Co. [Cl. 206-65]

A tubular package for metal-foil bottle caps, which is constructed of heavy paper, is formed in such a manner that the skirt portions of the nested caps are rigidly supported and protected against damage in handling. 4 figures. E.G.S.

PAPER—COATED

BARRETT, GERALD R. Coated papers and methods and compositions for preparing same. U. S. patent 2,576,914. Filed Feb. 28, 1948. Issued Dec. 4, 1951. 18 claims. Assigned to Monsanto Chemical Company. [Cl. 117-155]

A paper coating composition comprises a pigment; a water-soluble ammonium salt of a copolymer of 1-1.5 moles of styrene with the reaction product of 0.1-0.4 mole of methanol, 0.4-0.85 mole of methylisobutylcarbinol, and 1 mole of maleic anhydride; 10-100% (based on the weight of the above salt) of an unsaturated fatty acid which contains 15-18 carbon atoms, its water-soluble salts (e.g., ammonium oleate, linoleate, or ricinoleate), or mixtures thereof; and water. A paper coated with this composition has good water resistance and is adapted for embossing without chipping or cracking of the coating. E.G.S.

MILLER, EMERY P. Electrostatic deposition of elastomer material. U. S. patent 2,551,035. Filed Jan. 30, 1946. Issued May 1, 1951. 6 claims. Assigned to Ransburg Electro-Coating Corp. [Cl. 204-165]

A method is described for the electrostatic deposition of oriented, elongated particles of an organic elastomer (e.g., natural or synthetic latex) upon

a surface (e.g., paper, fabric, wood, metal, or the like) to produce a resilient coating. 1 figure. E.G.S.

NILES, GEORGE E. Mineral-coated paper and process of producing same. U. S. patent 2,577,624. Filed March 29, 1947. Issued Dec. 4, 1951. 7 claims. Assigned to Monsanto Chemical Company. [Cl. 117-155]

A high-brightness, mineral-coated printing paper which has excellent ink receptivity is coated on at least one side with a coating color which consists essentially of 67% water and 33% solids (mineral pigment and 10% of a water-soluble ammonium salt of styrene-maleic anhydride copolymer). The coated paper stock is dried and calendered until the coating has a smooth, continuous surface. E.G.S.

SZWARC, ALEXANDER. Manufacture of coated water-vapor proof paper and coating compositions. Canadian patent 479,085. Filed March 6, 1948. Issued Dec. 4, 1951. 2 claims. Assigned to Canada Paper Company.

A water-vaporproofing composition for the coating of paper consists of 55-65% of a polymerized coumarone-indene resin; 8-12% of ethylcellulose; 10-20% of a rosin plasticizer selected from the group consisting of the methyl ester and hydrogenated methyl ester of rosin; 3-6% of a polymer of isobutene plasticizer obtained by the low-temperature polymerization of isobutene, using a fluoride as a catalyst; 8-14% of a paraffin wax which melts at 122-150°F.; and 1-3% of zinc stearate. This is the same as U. S. patent 2,538,397; *cf.* B.I.P.C. 21: 440. E.G.S.

PAPER—COATED (WRINKLE COATING)

FISHER, JOHN R., JR. Method of applying a modified wrinkle finish coating to a base. U. S. patent 2,576,290. Filed Dec. 29, 1949. Issued Nov. 27, 1951. 1 claim. Assigned to New Wrinkle, Inc. [Cl. 117-41]

A method for the application of a wrinkle-coating composition to a base comprises the steps of applying to the surface of the article to be finished a wrinkle-drying composition which contains a phenol-formaldehyde resin, a wrinkle-drying oil (e.g., tung oil), a solvent (e.g., naphtha) and a drier (e.g., lead acetate); drying the coating for approximately 15 minutes to form a skin over the surface before wrinkling has been initiated; applying a spatter coating which consists of a number of segregated droplets of a pigmented, resinous-oil, liquid coating composition which has a viscosity of 2.5-5.5 poises and is of a different color from the wrinkle-coating composition; and drying the coating at 150-250°F. to produce a wrinkle finish on the article. 5 figures. E.G.S.

PAPER—RESTORING

VLAD, JOHN, and FISHER, JOHN R., JR. Method of reconditioning paper surfaces. U. S. patent 2,576,320. Filed May 1, 1946. Issued Nov. 27, 1951. 1 claim. Assigned to The Commonwealth Engineering Company of Ohio. [Cl. 117-2]

A composition which is recommended for use as an inhibitor of so-called "ghosts" (caused, e.g., by erasures or folds) on blueprints, photocopies, and other reproductions comprises a mixture of 35 parts of glycerin and 65 parts of ethyl alcohol. E.G.S.

PAPER SIZING

LOLKEMA, JAN, and VAN DER MEER, WILLEM A. Starch preparation soluble in cold water and process of making the same. U. S. patent 2,562,558. Filed Nov. 1, 1946. Issued July 31, 1951. 3 claims. Assigned to Naamlooze Vennootschap W. A. Scholten's Chemische Fabrieken. [Cl. 260-17.3]

A process is described for the preparation of a cold-swelling starch composition which is suitable for use as a paper or textile sizing agent. As an example, 50 parts by weight of melamine and 1000 parts by weight of thin boiling starch are suspended in a mixture of 500 parts by weight of a 30% formaldehyde solution and 650 parts by volume of water. The resulting suspension is adjusted to a pH of 8 and converted to cold-swelling starch in the usual manner. E.G.S.

PAPER SPECIALTIES

BERGLUND, ORION W. Apparatus for making flock covered paper. U. S. patent 2,576,276. Filed Aug. 2, 1948. Issued Nov. 27, 1951. 4 claims. Assigned to The Commonwealth Engineering Company of Ohio. [Cl. 91-8]

A flock-covered (e.g., with rayon, cotton, wool, paper, or asbestos flock) paper sheet which has a suedelike appearance is prepared by depositing the flock material onto a temporary base (e.g., a 100-mesh metal screen and a cloth made of a vinyl chloride-vinyl acetate copolymer) to which suction is applied; superimposing an adhesive-coated paper sheet as a permanent base over the flock-covered temporary base so that the flock is transferred to the permanent base; removing the flock-covered permanent base from the temporary base; and subjecting the former to drying. 2 figures. E.G.S.

BODE, JOHN N. Laminated paper product. U. S. patent 2,576,278. Filed May 10, 1951. Issued Nov. 27, 1951. 4 claims. [Cl. 154-55]

A flexible, composite, laminated paper wrapping material for irregularly shaped articles incorporates a corrugated cushion layer and an outer scuff-resistant layer which is secured directly or indirectly to the corrugated layer along comparatively widely separated, narrow strips. 7 figures. E.G.S.

CRANSHAW, HAROLD B. Folding paper cup. U. S. patent 2,577,109. Filed July 9, 1949. Issued Dec. 4, 1951. 3 claims. Assigned to Burnitol Manufacturing Co. [Cl. 229-25]

A folding paper cup which is designed for hospital use incorporates a pivoted cover which is held in place by a rubber band. The cover is raised by the application of a downward pressure on an overhanging portion of the same. 7 figures. E.G.S.

FLOWERS, RALPH G., and ELLIOTT, EDSALL D., JR. Production of polymers and copolymers of acenaphthylene. U. S. patent 2,563,524. Filed Jan. 3, 1949. Issued Aug. 7, 1951. 5 claims. Assigned to General Electric Company. [Cl. 260-83.7]

A process for the preparation of a paper-impregnating composition comprises the steps of forming an aqueous emulsion which contains 10 parts by weight of acenaphthylene, 1-20 parts by volume of ethylbenzene, an emulsifying agent for the above constituents, and at least 0.4 part by weight of a

peroxide catalyst, and heating and agitating the mixture at 20-80°C. for 15 hours. E.G.S.

GEIMER, WILLIAM J., and LINDA, FRANK R. Sealing tape for tubular bag bodies. U. S. patent 2,576,933. Filed May 6, 1946. Issued Dec. 4, 1951. 1 claim. Assigned to Bemis Bro. Bag Company. [Cl. 154-53.5]

A multi-ply, heavy-duty sealing tape which is adapted to provide a flexible closure for flexible-wall paper bags consists of a ply formed of a coarsely woven textile material, and a kraft paper ply which is coated on one side with a thermoplastic adhesive to provide a barrier layer which is impervious to moisture and chemicals. The other side of the kraft ply is coated with a second thermoplastic adhesive, the melting point of which is lower than that of the first-mentioned adhesive composition. 7 figures. E.G.S.

MELTON, ROMIE L., BENNER, RAYMOND C., and KIRCHNER, HENRY P. Granular coated webs and method of making same. U. S. reissue patent 23,395. Filed Aug. 13, 1945. Issued July 24, 1951. 18 claims. Assigned to The Carborundum Company. [Cl. 51-301]

A process is described which involves the application of a base coat of wet adhesive to a flexible web of paper or cloth, the deposition of a layer of abrasive granules (e.g., crushed silicon carbide or crushed, fused alumina) over the base coat, and the spray application of a sizing coating of liquid adhesive onto the abrasive-coated web. The sizing material is applied from a steam suspension which contains a solvent of the adhesive. This is a reissue of U. S. patent 2,201,194, which was issued May 21, 1940. 4 figures. E.G.S.

PETERS, GARRETT H. Method of coating glassine. U. S. patent 2,575,727. Filed Nov. 12, 1947. Issued Nov. 20, 1951. 5 claims. Assigned to Rhinelander Paper Company. [Cl. 117-76]

A method for the preparation of coated glassine comprises the pretreatment of the surface of the glassine with an aqueous solution of an alkali metal or ammonium salt of a polyvalent, slightly ionized inorganic acid (e.g., sodium carbonate, bicarbonate, phosphate, pyrophosphate, monobasic phosphate, dibasic phosphate, metasilicate, or orthosilicate, or ammonium dibasic phosphate) and the subsequent application of a synthetic thermoplastic lacquer composition (e.g., vinyl chloride-vinyl acetate copolymers, chlorinated rubber, or cyclorubber) to the treated surface of the sheet. E.G.S.

RATHKE, HARRY C. Decalcomania and method of applying same. U. S. patent 2,578,150. Filed Dec. 12, 1947. Issued Dec. 11, 1951. 10 claims. Assigned to The Meyercord Co. [Cl. 154-98]

A decalcomania transfer which is suitable for use on meats and poultry comprises a paper backing coated with a water-soluble gum, a resin-free cellulose nitrate lacquer film on the gum-coated surface of the backing, a transfer design applied over the lacquer film, and a resin-free adhesive layer of ethylcellulose over the design. 3 figures. E.G.S.

SMITH, ROBERT L., and WIGHT, MARSHALL A., JR. Article with water-sensitive gum coating and method of manufacture. U. S. patent 2,577,821. Filed March 4, 1947. Issued Dec. 11, 1951. 5

claims. Assigned to Nashua Gummed and Coated Paper Company. [Cl. 117-122]

An adhesive composition which is suitable for application to paper tape consists, for example, of 250 parts by weight of 70-gram bone glue (40% solution) and 50 parts by weight of Solvesso xylol. After application to the tape, the coating is dried in two heating stages; the water is evaporated initially, and the xylol is subsequently removed at a higher temperature. The resultant coating has a porous structure which is formed by the replacement of the solvent by air. E.G.S.

SOSNOWICH, MICHAEL. Paper dust collecting bag for vacuum cleaners. U. S. patent 2,577,863. Filed Sept. 29, 1949. Issued Dec. 11, 1951. 3 claims. [Cl. 183-51]

A disposable paper dust-collection bag for use in vacuum cleaners incorporates tucks or pleats in its side walls which are designed to reduce sudden shocks from air pressure in the bag. 8 figures. E.G.S.

SOUTHWICK, CHARLES A., JR. Desiccant pouch. U. S. patent 2,578,324. Filed Sept. 7, 1945. Issued Dec. 11, 1951. 3 claims. Assigned to Shellmar Products Corporation. [Cl. 183-4.8]

Pouches or containers for desiccants (e.g., silica gel) are formed by heat sealing laminated sheets of kraft paper and a vinyl chloride-vinyl acetate-impregnated tissue. 5 figures. E.G.S.

VALENTE, JOHN E. Molded filter product. U. S. patent 2,576,864. Filed July 13, 1946. Issued Nov. 27, 1951. 9 claims. Assigned to Paper Patents Company. [Cl. 210-204]

In the manufacture of an oil-filter element, a suitably dimensioned pad or bat of thin, resin-impregnated, creped tissue sheets is placed within a mold, preferably with a mandrel or mandrels, and the entire assembly is subjected to heat and pressure to shape the pad or bat into the desired form and to cure the resin, so that the resulting product will be integrally bonded together to form a strong, self-supporting structure. 19 figures. E.G.S.

WITTHOFT, HERBERT C. Rot-resistant insulated cable. U. S. patent 2,577,059. Filed Aug. 24, 1948. Issued Dec. 4, 1951. 1 claim. Assigned to Anaconda Wire and Cable Company. [Cl. 174-116]

A rot-resistant, insulated electrical cable comprises two copper conductors which are enclosed in extruded-rubber jackets and separated by a glass fiber-reinforced rubber spacer, a thin adhesive-coated paper wrapper which is applied directly over the assembly of insulated conductors and spacer, and an outer extruded-rubber jacket. 1 figure. E.G.S.

PHYSICAL TESTING—PAPER—GLOSS

BOWERS, KENNETH, and MASON, THOMAS E. Glossmeter. U. S. patent 2,578,625. Filed July 3, 1948. Issued Dec. 11, 1951. 2 claims. Assigned to Glens Falls Laboratory, Inc. [Cl. 88-14]

A glossmeter is adapted for the continuous measurement of the gloss of a running paper web immediately after the web leaves a calender stack and before it passes to a winder. Means are also included for the continuous comparison of the gloss of the paper with a standard of known reflectivity. 10 figures. E.G.S.

PHYSICAL TESTING—PULP—FREENESS

NILSON, CLIFTON N. Apparatus for controlling freeness of papermaking stock. U. S. patent 2,577,712. Filed May 17, 1947. Issued Dec. 4, 1951. 3 claims. Assigned to Cheney Bigelow Wire Works. [Cl. 92-46]

An apparatus for controlling the freeness of papermaking stock is located adjacent to the refining or conditioning apparatus, and stock is delivered simultaneously to the refining unit. Thus the stock is continuously tested, or the freeness is continuously determined, and adjustments are made when necessary in order that stock of desired and uniform freeness is delivered to the paper machine. 7 figures. E.G.S.

PULP AND PAPER—IMPURITIES

LANGMEIER, ARTHUR. Froth flotation of siliceous impurities from cellulose. U. S. patent 2,576,464. Filed Aug. 5, 1949. Issued Nov. 27, 1951. 15 claims. Assigned to Hercules Powder Company. [Cl. 209-166]

A process for the removal of siliceous impurities from cellulosic materials (e.g., chemical cotton, wood pulp, and straw pulp) consists in forming a dilute aqueous slurry of the material, dispersing a cationic surface-active substance (e.g., dehydroabietylamine acetate) and a surface-tension depressant (e.g., pine oil or cumene hydroperoxide) for the water in the slurry, agitating and aerating the system thus formed, continuously removing the froth formed on the surface of the system, and separating the purified cellulosic material from the system. E.G.S.

SETUP BOXES

JAMES, LOUISE. Locking means for boxes. U. S. patent 2,577,248. Filed June 16, 1947. Issued Dec. 4, 1951. 4 claims. Assigned to Huye Space Saving Box System Inc. [Cl. 229-45]

Locking tongues for boxes are stiffened against buckling about a transverse axis by the arrangement of their side edges in frictional engagement with the corresponding edges of locking slots or recesses. 4 figures. E.G.S.

SHIPPING CONTAINERS

BAUMANN, MARTIN. Shipping container. U. S. patent 2,575,784. Filed April 15, 1949. Issued Nov. 20, 1951. 3 claims. Assigned to International Paper Company. [Cl. 206-46]

A corrugated shipping carton is adapted for the packaging of bulky but relatively lightweight manufactured articles, such as washing machines, storage cabinets, or the like. The container is maintained in assembled condition by steel strapping. 4 figures. E.G.S.

GRANT, JESSE R. Egg case. U. S. patent 2,578,060. Filed Feb. 21, 1946. Issued Dec. 11, 1951. 9 claims. [Cl. 229-15]

A fiberboard egg case is closed by a cover which is locked onto the case at both ends and in the middle and which can be completely removed from the case. 5 figures. E.G.S.

PAIGE, RICHARD E. Double-walled collapsible carton. U. S. pat-

ent 2,577,588. Filed Nov. 29, 1946. Issued Dec. 4, 1951. 26 claims. [Cl. 229-41; changed to 229-14]

A shipping carton for apples, vegetables, and other produce incorporates a double-wall bottom which is formed by a series of foldable, automatically interlocking toggle strips. 22 figures. E.G.S.

THACKER, BERNARD J., HARRIS, SCOTT C., and NEWSTROM, WALTER O. Shipping package for storage batteries. U. S. patent 2,578,107. Filed April 26, 1949. Issued Dec. 11, 1951. 3 claims. Assigned to I. Henry Harris, Jr. [Cl. 229-14]

A cardboard carton is designed to form a protective casing or hood for a storage battery and to provide tabs which may be rolled up to form a spacer or terminal protector integral with the remaining portions of the carton. 3 figures. E.G.S.

SHIPPING CONTAINERS—FIBER DRUMS

PAGE, JOHN E. Container construction. U. S. patent 2,577,148. Filed May 7, 1946. Issued Dec. 4, 1951. 9 claims. Assigned to Gibson Patent Containers, Ltd. [Cl. 229-5.7]

A cylindrical paperboard container for bulk ice cream is constructed in such a manner that the folding and pasting of the edges of the container body to form a rim-engaging ledge are eliminated. 12 figures. E.G.S.

SHIPPING CONTAINERS—MULTIWALL BAGS

SHARKEY, WILLIAM E. Valve sleeves and methods of inserting the same. Canadian patent 478,580. Filed Aug. 26, 1948. Issued Nov. 13, 1951. 11 claims. Assigned to The Raymond Bag Company.

A soft paper valve sleeve which is adapted for use in conjunction with cement bags and the like is claimed to afford reduced leakage of the bagged material. 7 figures. E.G.S.

SULFITE WASTE LIQUOR

BIRD, PAUL G. Inhibition of scale formation in steam generation. U. S. patent 2,576,386. Filed Dec. 6, 1948. Issued Nov. 27, 1951. 5 claims. Assigned to National Aluminate Corporation. [Cl. 252-181; changed to 210-23]

Scale formation is prevented in steam generators by the incorporation in the boiler feed water of a scale-inhibiting, water-soluble substance which results from the alkaline hydrolysis of sodium lignosulfonate with caustic soda at 200-225°C. for 20-120 minutes under superatmospheric pressures sufficient to maintain the liquid phase. E.G.S.

MANGOLD, MICHAEL, and NEUBER, FRITZ. Manufacture of tanning substances. U. S. patent 2,559,305. Filed Feb. 20, 1948. Issued July 3, 1951. 6 claims. [Cl. 260-124]

A process for the preparation of a tanning agent from spent sulfite liquor comprises the treatment of the concentrated (30° Bé.) liquor with a 60% caustic soda solution at 90-100°C. for 6-8 hours; introduction of carbon dioxide in a first stage until a pH of 9 is attained in the solution; separation from the liquid of the resultant mixture of sodium sulfite, sodium sulfate,

and sodium carbonate; introduction of carbon dioxide in a second stage until a pH of 7.5 is reached; separation from the liquid of the formed carbonates, bicarbonates, and soaplike substances; acidification of the liquid to precipitate the tanning substances; and separation of the same from the liquid. E.G.S.

SALVESEN, JÖRGEN R., and HARMON, CARLYLE. Lignin compounds and methods for making same. U. S. patent 2,576,418. Filed Dec. 6, 1948. Issued Nov. 27, 1951. 7 claims. Assigned to Marathon Corporation. [Cl. 260-124]

A process for the production of a lignin compound by controlled alkaline hydrolysis comprises the steps of preparing an aqueous mixture which contains 250-350 grams per liter of sodium lignosulfonate (derived from spent sulfite liquor) substantially free of calcium and magnesium ions, and 8-25 grams per liter of free caustic soda, and heating the mixture under pressure at 200-225°C. for 20-120 minutes. E.G.S.

TALL OIL

BABAYAN, VIGEN K. Cyclic reuse of cyclohexylamine in rosin acids separation. U. S. patent 2,578,661. Filed Sept. 1, 1949. Issued Dec. 18, 1951. 5 claims. Assigned to The Fulwal Chemical Corporation. [Cl. 260-97.6]

A rosin-bearing material (e.g., tall oil) is dissolved in an organic solvent in which the rosin cyclohexylide is insoluble, and cyclohexylamine is added to the solution, whereupon the rosin cyclohexylide is precipitated. The precipitate is hydrolyzed with an aqueous solution of a hydrolyzing acid (e.g., sulfuric acid) in the presence of a solvent for the rosin acids, after which stratification yields a solvent layer containing the rosin acids and an aqueous layer containing the reaction product of the cyclohexylamine and the hydrolyzing acid. The aqueous layer is separated, and alkali is added in an amount substantially equal to that required to neutralize the quantity of hydrolyzing acid employed, whereupon an aqueous solution is formed which contains the reaction product of the hydrolyzing acid and the alkali, as well as the liberated cyclohexylamine. The resulting solution is used as such by mixture with a solution of additional tall oil, whereupon the cyclohexylamine reacts with the rosin acids to form additional cyclohexylide which, in turn, is hydrolyzed and treated in accordance with the procedure outlined above. 1 figure. E.G.S.

HAMM, PHILIP C. Tall oil-melamine reaction product and process. U. S. patent 2,577,418. Filed Nov. 15, 1949. Issued Dec. 4, 1951. 2 claims. Assigned to Monsanto Chemical Company. [Cl. 260-97.5]

A water-repellent composition (mixed *N,N',N''*-triacylmelamines) which is suitable for the treatment of wood products (e.g., lumber, plywood, and the like) comprises the reaction product of three moles of tall oil anhydride with one mole of melamine at 160-230°C. for 15-60 minutes in a substantially water-free system. E.G.S.

KIRKPATRICK, WILLARD H. Chemical compositions and process for the preparation thereof. U. S. patent 2,577,198. Filed Dec. 28, 1948. Issued Dec. 4, 1951. 8 claims. Assigned to Visco Products Company. [Cl. 260-97.5]

A surface-active chemical composition which is useful as a demulsifier is prepared by the reaction of a molecularly dehydrated acylated triethanolamine and phthalic anhydride. The triethanolamine is present in 100-600% molar excess, and tall oil is used as the acylating agent. E.G.S.

LINDER, AKE V. B. Distillation and rectification columns and processes for distilling by means of said columns. Canadian patent 478,560. Filed March 19, 1947. Issued Nov. 13, 1951. 4 claims. Assigned to Mo och Domsjö Aktiebolag.

A distillation column which is particularly adapted for the fractionation of crude tall oil incorporates a series of horizontal baffles in place of the conventional plates or packing. 6 figures. E.G.S.

MCMURRAY, LYNN L., and MOYER, SAMUEL P. Flotation of nelsonite ores. Canadian patent 479,071. Filed Feb. 23, 1946. Issued Dec. 4, 1951. 11 claims. Assigned to American Cyanamid Company.

As an example, an apatite-ilmenite concentrate, which is obtained through a previous treatment of a whole ore for other purposes, is pulped with water to about 55% solids, placed in a Fagergren flotation cell with the air inlet closed, and conditioned for about five minutes with 3.75 pounds of starch caustic (22 parts of caustic to one part of starch) and 0.58 pound of tall oil per ton of flotation feed. The conditioning is carried out with a propeller-type agitator. The conditioned pulp is diluted to about 15% solids (pH 10.5-10.6) and floated for 10 minutes. The resulting apatite concentrate is collected and given a single cleaner flotation. This is the same as U. S. patent 2,525,146; *cf.* B.I.P.C. 21: 222. 2 figures. E.G.S.

MARLING, PAUL E. Coating composition comprising the reaction product of vinyl esters of tall oil acids with styrene and an isopropenyl compound, and the method of preparation. U. S. patent 2,577,709. Filed Sept. 29, 1948. Issued Dec. 4, 1951. 10 claims. Assigned to Monsanto Chemical Company. [Cl. 260-27]

A method for the preparation of a surface composition which is capable of forming transparent, colorless, water-resistant coatings comprises the steps of heating vinyl esters of tall oil acids while gradually adding thereto 66.7-150% of a mixture of 50-95% styrene and 5-50% of an isopropenyldiphenyl at the reflux temperature of the reaction mixture and in the presence of benzoyl peroxide as a catalyst; heating the mixture to 500-550°F.; and thinning the product with a miscible solvent. E.G.S.

MORWAY, ARNOLD J., and KOLFENBACH, JOHN J. Lubricating grease containing soaps of tall oil. U. S. patent 2,576,031. Filed April 9, 1949. Issued Nov. 20, 1951. 7 claims. Assigned to Standard Oil Development Company. [Cl. 252-33.6]

A lubricating grease composition consists essentially of 65-93% by weight of mineral-base lubricating oil, 5-20% of a soda soap of tall oil, and 2-10% of sodium furoate. E.G.S.

MOYER, SAMUEL P. Flotation of ilmenite ores. Canadian patent 479,074. Filed June 24, 1948. Issued Dec. 4, 1951. 5 claims. Assigned to American Cyanamid Company.

Tall oil (2.5 lb./ton of ore) is used as an anionic promoter in the separa-

tion by froth flotation of titanium oxide minerals from low-grade ores which contain excessive amounts of phosphate-bearing minerals (e.g., apatite, ilmenite, or nelsonite). This corresponds to U. S. patent 2,557,455; *cf.* B.I.P.C. 21: 829. E.G.S.

VACUUM PACKAGING

WATERS, HARRY F. Bag with vacuum sealed valve closure. U. S. patent 2,576,322. Filed July 5, 1947. Issued Nov. 27, 1951. 2 claims. [Cl. 229-62.5]

A weevil- and vermin-resistant bag which is adapted for the vacuum packaging of nuts, flour, grain, and the like is formed of a laminated sheet material which comprises an outer paper sheet and an inner impervious sheet of plastic-coated metal foil. 2 figures. E.G.S.

VANILLIN

FISHER, JOHN H., and MARSHALL, HARRY B. Method of producing vanillin. U. S. patent 2,576,752. Filed Jan. 7, 1949. Issued Nov. 27, 1951. 11 claims. Assigned to The Ontario Paper Company, Limited. [Cl. 260-600]

A batch process is described for the production of oxidation products, including vanillin, from lignosulfonic acid compounds (e.g., spent sulfite liquor). This corresponds to Canadian patent 467,552; *cf.* B.I.P.C. 21: 144. 1 figure. E.G.S.

FISHER, JOHN H., and MARSHALL, HARRY B. Method of producing vanillin. U. S. patent 2,576,753. Filed Jan. 7, 1949. Issued Nov. 27, 1951. 4 claims. Assigned to The Ontario Paper Company, Limited. [Cl. 260-600]

A method for the production of vanillin and other oxidation products from lignosulfonic acid compounds (e.g., spent sulfite liquor) consists in subjecting the compounds in the presence of lime as the active alkali at a pH of 12 or greater to the action of free oxygen finely dispersed in a gaseous medium. The reactor temperature is 120-200°C., the partial pressure of oxygen within the vessel is less than 20 p.s.i., and the reaction time is less than four hours. This corresponds to Canadian patent 467,553; *cf.* B.I.P.C. 21: 144. E.G.S.

FISHER, JOHN H., and SANKEY, CHARLES A. Method of producing vanillin. U. S. patent 2,576,754. Filed Jan. 7, 1949. Issued Nov. 27, 1951. 8 claims. Assigned to The Ontario Paper Company, Limited. [Cl. 260-600]

A continuous process is described for the production of oxidation products, including vanillin, from lignosulfonic acid compounds (e.g., spent sulfite liquor). This corresponds to Canadian patent 467,554; *cf.* B.I.P.C. 21: 144. 3 figures. E.G.S.

SALVESEN, JÖRGEN R., DIDDAMS, DONALD G., BRINK, DAVID L., and OWZARSKI, PETER. Processes for making vanillin. Canadian patent 478,555. Filed Dec. 9, 1947. Issued Nov. 13, 1951. 8 claims. Assigned to Marathon Corporation.

As an example, a liquor which contains 231 g./l. of basic calcium lignosulfonate and 105 g./l. of sodium hydroxide is cooked at 160°C. for 70

minutes; during this period air is introduced into the reaction mixture in sufficient amounts so that 32 g. of oxygen are consumed for each 100 g. of lignin present. The increase in vanillin yield from this cook over that obtained by cooking the same liquor under optimum conditions for maximum vanillin yield without the introduction of oxygen is 82%. This is the same as U. S. patent 2,434,626; *cf.* B.I.P.C. 18: 419-20. 2 figures. E.G.S.

WET STRENGTH

JONES, GEORGE F. Stable, water soluble, cationic melamine formaldehyde resins. U. S. patent 2,577,767. Filed March 9, 1950. Issued Dec. 11, 1951. 13 claims. Assigned to Imperial Paper and Color Corporation. [Cl. 260-67.6]

As an example, a cationic resin which is suitable for use in the manufacture of wet-strength paper is prepared by mixing one mole of melamine with one to four moles of glycerin, 7.5 moles of formaldehyde, and one mole of di- or triethanolamine; heating the mixture until a homogeneous substance is obtained; temporarily adjusting the pH of the mixture to about 1.5 with 32% hydrochloric acid; and then raising the pH to about 6-7. E.G.S.

WOOD—EXTRACTIVES

LACKEY, HOMER B. Process for the separation of conidendrin from liquors containing the same. U. S. patent 2,577,470. Filed April 18, 1949. Issued Dec. 4, 1951. 14 claims. Assigned to Crown Zellerbach Corporation. [Cl. 260-344.6]

A process is set forth for the isolation of conidendrin from spent sulfite liquor. As an example, 6 liters of magnesium-base spent liquor from the pulping of western hemlock (pH 3.8, solids content 11.1%) are agitated for 30 minutes with 120 ml. of trichloroethylene, after which the resulting mixture is allowed to stand at room temperature for 24 hours. The upper aqueous layer is siphoned off, and the lower layer filtered. The yield of solid conidendrin is 4.5 grams, or 0.75 g./l. of spent liquor. 1 figure. E.G.S.

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